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THE  
QUARTERLY JOURNAL  
OF  
ECONOMICS

FEBRUARY, 1918

THE FERTILIZER NEEDS OF THE  
UNITED STATES

SUMMARY

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I. INTRODUCTION

THE fertilizer requirements of a country are determined by several very different conditions. Prominent among these are:

- (1) The amount and distribution of the annual rainfall.
- (2) The physical texture and origin of the soil.
- (3) The temperature, amount of sunshine, and duration of the growing season.
- (4) The system of farming followed.
- (5) The kinds of crops grown and sold from the farm.

Where the rainfall is always light and the total amount per annum is small, the nitrates which are formed by direct and indirect bacterial action in the

soil are not subject to loss by leaching. On this account they have accumulated to an extent injurious to vegetation in parts of Colorado, Utah, and elsewhere in the arid and semi-arid regions of the West. What is true of nitrates is equally true of certain calcium, magnesium, potassium and sodium compounds. The excessive accumulations of the last named have given rise to the white alkali (sodium sulphate) and to the more greatly dreaded black alkali (sodium carbonate) of many western lands.

In the tropics, on the contrary, where the total rainfall is great and where several inches of rain may fall within a few hours, nitrates are likely to be leached out of the soil to a serious extent, especially if it is of a sandy character. In such circumstances potassium, sodium, calcium and magnesium salts are also lost to a considerable extent by leaching. It is, in fact, not uncommon in the tropics for the soil silicates to become so depleted of the basic ingredients and silica that laterite (a ferruginous aluminum hydroxide) is practically all that remains.

Because of the influence of rainfall, potash is quite generally required as a supplement to the soil supply in many sections of the East and South and even to some extent for certain crops as far west as Texas, Missouri and Wisconsin; and possibly, in the case of crops requiring much potash, even at more distant western points.

In general, siliceous, sandy soils are notably deficient in nitrogen, phosphoric acid and lime, and seriously tho often to a less extent in potash, and occasionally in magnesia. Soils of limestone origin are usually less in need of phosphoric acid than those derived from granite, siliceous conglomerates, sandstone or even from certain shales and slates. Muck and peat soils are

usually seriously in need of potash and are deficient in phosphoric acid, because, whatever amounts of these ingredients may have been present in the vegetation from which they were formed, conditions have been most favorable to their subsequent loss by leaching. Clayey soils and to a less extent silt loam soils are often fairly well supplied with potash, unless they have been cropped heavily with plants which remove large amounts of it from the soil.

High temperature coupled with excessive rainfall is not only conducive to serious loss of the plant-food bases ordinarily present in soil silicates, but also to the rapid nitrification of ammonium salts and organic ammoniates, which necessitates the frequent renewal of the humus and the frequent use of liberal quantities of nitrogen in suitable combinations.

It is a notable fact that crops which grow and mature in a short time, early in the season before nitrification has become most active, as, for example, certain of the small grains, are much more in need of nitrogenous fertilizers than Indian corn, which grows practically throughout the entire season. But no system of farming is so destructive of soil humus or necessitates such liberal supplies of plant food as "truck" or market gardening, because the land is used continuously or almost continuously for hoed crops. Furthermore, the earliest truck soils are usually sandy and hence readily lose some of their plant food by leaching. Where the area under cultivation is ample, the occasional laying down of part of the land to grass, clover, alfalfa and similar crops, or the turning under of green crops will lessen the necessity for manure as a physical ameliorant, but will not lessen greatly the need for inorganic salts, particularly for potash and phosphoric acid. The turning under of leguminous crops which, in conjunc-

tion with a few non-legumes, have the capacity for assimilating and fixing atmospheric nitrogen by virtue of the bacteria which inhabit the nodules on their roots, will often add considerable nitrogen to the soil. It must be remembered, however, that they, like other plants, can and do utilize much of the combined nitrogen already available in the soil and that often, therefore, only a part of their nitrogen content represents actual fixation of the free nitrogen of the air.

A system of agriculture in which the culture of deep rooting crops like clover and alfalfa is practised, has an advantage over the continual growth of shallow rooting crops, such as the strawberry, for the reason that the deeper roots are able to draw some mineral foods from levels which are inaccessible to the other plants. It should be borne in mind that the plant is not dependent solely upon the plant food present in water-soluble form, but that the roots have the power of dissolving more or less plant food from the soil particles.

The selling of cereals or milk will rapidly deplete a farm of its available supply of phosphoric acid, whereas the raising of cattle and swine, and the sale of cream or butter instead of milk, will greatly conserve the supply of plant food. The greatest possible conservation of the native plant food of the soil is effected by the growing of legumes, in conjunction with the practice of animal husbandry, and by selling from the farm practically nothing but cream, butter and farm animals. And the cotton grower, if he were to have his cotton seed returned as cake after the extraction of the oil and fed on the farm, would be conducting his business essentially on the same economic plan as the farmer who sells chiefly cream or butter, for he would be selling from the farm but little plant food, and the farm manure would aid him materially in the maintenance of a good supply

of humus and of the tilth of the soil. The farmer, who sells milk, hay, cereals, beets, turnips, and tobacco is following a plan which will lead to depletion unless suitable amounts of plant food are returned to the soil. The grower of cereals, when he sells his straw for the manufacture of paper or for other purposes instead of utilizing it on the farm, is hastening still further the time when plant food must be purchased in order to maintain maximum production.

## II. NITROGEN

Can the use of nitrogenous fertilizers be curtailed without economic loss? It is an accepted fact that a large amount of ammonia which escapes from farm manures might be saved if proper methods of handling and applying it were employed. No doubt also a much larger amount of atmospheric nitrogen would be fixed in our soils than at present if they were properly limed, for the *Azotobacter* which require no association with host plants multiply far more freely in limed soil and are able to fix much greater quantities of atmospheric nitrogen than in highly acid soils which are practically devoid of carbonate of lime. When one considers the fact that more than 200 million acres of the cultivated land in the United States are in serious need of liming, the significance of liming as a matter of national economy becomes apparent. The importance of the use of lime as a factor in nitrogen economy is further emphasized by the fact that there are hundreds of thousands of acres of land in the United States which cannot be made to produce successfully clover, alfalfa and certain leguminous or other nitrogen-fixing plants until they are properly limed. The great obstacle in the way of fixing more free atmospheric nitrogen by means of

*Azotobacter* and legumes is the difficulty of reaching every farmer whose land needs liming and of convincing him of the possibilities of profit from its use. Unfortunately many such farmers are unable to purchase the lime because of lack of resources, while their natural timidity restrains them from the venture of borrowing; and finally, if they could be brought to the point of using lime freely the railroads would be utterly unable at this time to deliver the 200 to 300 million tons of ground limestone or other forms of lime which should be used the coming spring.

For these various reasons there is little hope that the use of lime will immediately lessen the necessity and demand for nitrogenous fertilizers. In fact, when we consider that in 1914 we were using in the United States on our 478.5 million acres of tillable land only about 7 million tons of fertilizer as compared with the use of approximately the same amount by Germany on her 81.9 million acres, it will be seen that we have probably only begun to approach our actual requirements if our crop production is to be raised to its highest possible level. It has been stated by Professor Von Seelhorst of the University of Göttingen, Germany, that half of the increase in the German crops in the years just prior to the war was due to the greater use of fertilizers; Professors Schneidewind and Gerlach also attribute a very large part of the increase to the same cause; and it must not be forgotten that nitrogen constitutes a very important part of both the German and American fertilizer requirements.

The chief sources of nitrogen in commercial fertilizers are meat tankage from rendering establishments; cotton-seed meal; sulphate of ammonia, chiefly from by-product coke ovens; nitrate of soda from Chile; and calcium cyanamid of American manufacture. Dried



blood, fish waste and various other waste nitrogenous materials are also employed, some of which, tho of low availability in their native state, are made highly available to plants by special chemical treatment in the factory.

The question of great national importance at this time is, Can we safely curtail or do without nitrogenous fertilizers? In the discussion of our national potash requirements it seems to be the prevailing opinion of our agricultural scientists that in the past much more potash has been used in certain parts of the country than has been necessary, but it is a significant fact that this opinion does not seem to be held as concerns the use of nitrogen in the cotton fields of the South nor in connection with the growth of truck and general crops from Maine to Florida in the East, nor is it generally held concerning the use of nitrogen in the fertilizers for seedling winter wheat and other winter and spring grains.

Unfortunately as concerns organic ammoniates, the supply in its relation to the requirements of the country is steadily decreasing and the situation in this respect is likely to grow steadily worse, for our cattle production is not keeping pace with our increase in population and if it did, still more nitrogenous products, which have heretofore served as fertilizers, would be required for feeding. In the transformation of feed into manure and its transference to the field, considerable nitrogen is always lost. The animal ammoniates such as meat scrap, fish waste and meat tankage are being used more and more as animal food, as the price of other feeding stuffs advances. The domestic demand for cotton-seed meal or cake for cattle feeding is increasing steadily, and as a matter of national economy it should increase until every pound is utilized in this country. Vast quantities of plant food might thus be kept at home

instead of sending the meal or cake abroad to be fed to animals for the production of cheese, hides, milk sugar and other animal products which heretofore have been imported from Europe, Argentina and elsewhere.

The feasibility of the increase of our livestock and conservation of the plant food in our cotton seed is evident when one considers the vast areas of waste land in the North and especially in the South which are well adapted to the production of the roughage which must constitute the basal part of the animal ration. For the accomplishment of this purpose, the warfare against the southern cattle tick, the cause of Texas fever, must be continued until the entire South is free from this scourge. Hand in hand with this movement must go proper diversification of southern agriculture, not only in the ultimate interest of larger crops but also as a matter of ultimate national economy in transportation.

The idea of each section of the country producing only that which it can produce most profitably and then of exchanging products is fraught with fatal possibilities, as for example in seasons like the last when the corn in the corn belt was so seriously injured by frost that much of it molded in the bins, and when the potato crop of Aroostook County, Maine, was cut in half by blight. As a matter of national foresight, therefore, we must not put our eggs in one basket and as a consequence burden our overtaxed railroads with unnecessary transportation.

Even with the present extent of animal production and the existing demands for cattle foods, we are far from having adequate organic ammoniates to meet our present fertilizer requirements, and hence there can be no curtailment of their use unless far greater amounts of nitrates and ammonium salts can be made available.

As concerns nitrate of soda, the demand has kept steadily in advance of the possibility of supply because of the enormous requirements for the manufacture of munitions and of the difficulty in securing adequate shipment from Chile. This material is of special importance as a source of nitrogen for sugar beets, for truck crops which must be forced rapidly, also for potatoes, onions and other crops which are grown in cold climates. This is because the nitrogen in nitrates is in a form which can be taken and utilized by plants without undergoing bacterial transformation in the soil, whereas the greater part at least of the nitrogen in sulphate of ammonia must undergo nitrification before it becomes fully effective; most of that in organic ammoniates must undergo both ammonification and subsequent transformation into nitric acid and nitrates.

Another distinct advantage of nitrates such as nitrate of soda is that they are especially adapted to the spring top-dressing of grass, of winter cereals, and for periodic application for various crops which are grown on sandy soils.

In connection with the writer's earlier experiments with various nitrogenous fertilizers on a quite acid, upland, well-drained soil, it was found that while the efficiency of the nitrogen of nitrate of soda was normal or 100 per cent, the efficiency of the nitrogen in dried blood, one of the best of organic ammoniates, was only 45.5 per cent. Ammonium sulphate, instead of serving as an efficient fertilizer, was positively toxic. On the other hand, the efficiency of the nitrogen in dried blood, when used on properly limed soil, rose to 90 per cent and that of ammonium sulphate to 92 per cent. When one contemplates the fact that at least 200 million acres of land are being regularly tilled in the United States which are acid and in immediate need of lime, and that at least

a considerable part of this land may be sufficiently acid to materially lessen the efficiency of the nitrogen in these other forms, the great advantage of an adequate supply of nitrates becomes most obvious. In addition to the advantage of nitrates just cited, mention should also be made of the fact that after the plant has removed and utilized the nitric acid which it carries, the residue of soda is changed into sodium carbonates or is added to the basic ingredients of the soil silicates, so that the ultimate effect is to lessen slightly the prevailing acidity of the soil.

In the manufacture of commercial fertilizers nitrates such as nitrate of soda are not only of value by way of supplying nitrogen in a form which the plant can utilize without delay, but also for the reason that the soda or basic part of the material can combine in the soil with the sulphuric acid of the ammonium sulphate and can combine with the nitric acid formed from organic ammoniates or can replace in the soil silicates other bases which may enter into such combination. The nitrate, therefore, not only serves as an insurance of efficient action of the nitrogen in the associated nitrogenous compounds, but it also aids in maintaining a soil reaction best suited to most agricultural plants, for it is only the exceptional agricultural plant that thrives better on a quite acid soil than on one which is only slightly acid, neutral or but slightly alkaline.

From what has preceded it is evident that the increase of our supply of nitrates, from our western arid plains if possible, or if not from Chile, is of great importance in connection with our national food problem.

Too much emphasis cannot be laid upon the importance of stimulating the production of ammonia from soft coal in this country until every possible beehive coke oven is replaced by a by-product oven in order

that every pound of ammonia may be recovered. Such ammonia may be recovered as ammonium hydroxid or it may be utilized for refrigerating or be transformed into ammonium sulphate for fertilizer and other purposes. The latter compound is an excellent source of nitrogen for use in mixed fertilizers (with nitrates and organic ammoniates) because it stands between the two in its quickness of availability and also because the ammonia, unlike the nitrogen in nitrates, can enter into chemical combination with the soil silicates and thus be better safeguarded from loss by leaching until the plant requires it. Altho some of the ammonia may be utilized as such by many agricultural plants, most of it is transformed into nitric acid and nitrates before the plants actually use it.

### III. PHOSPHORIC ACID

By far the most important and generally deficient ingredient of fertilizers is phosphoric acid. The chief source of this plant food in the United States prior to 1870-80 was bone, much of which was ground and utilized in its raw state, or steamed and then ground. As a result of the discoveries made by Liebig and of the wide dissemination of the knowledge resulting from the work of Sir John B. Lawes and Dr. Gilbert of Rothamsted, England, the manufacture of bone into superphosphate by treatment with sulphuric acid was early undertaken in this country. As the knowledge of the increased availability and efficiency of superphosphate as compared with bone became widespread, the demand for superphosphate, just as in England, increased to such an extent that even the scouring of the old European battle fields and of the ends of the earth no longer furnished enough. The supply was increased for a time by the importation of guano from the islands of

the Pacific and elsewhere; but soon the discovery of the South Carolina phosphates, followed by those of Florida, Tennessee and finally of the western states, has placed at the disposal of the American people enormous supplies of rock phosphate which by treatment with sulphuric acid have been found to be quite the equal of the superphosphate made from bone. Phosphoric acid has not been used to excess in American agriculture; on the contrary, the general cry of agricultural chemists, agronomists and of well informed farmers is that more superphosphate should be made available, especially in the Middle West, where fertilizers were looked upon askance so long as corn was the cheapest available fuel and wheat was sold for a song. Now, with corn and wheat at undreamed-of prices, everything is undergoing a change, and the farmers of the Middle West are becoming fully awake to the fact that, aside from instances of serious deficiencies of lime, phosphoric acid is, in general, the plant-food ingredient in which their soils are chiefly deficient, and that they can reap an enormous benefit from applying superphosphate. It is also true that when this superphosphate is used, the opportunity for the profitable use of more nitrogen and even sometimes of potash is greatly increased.

So great and urgent has become the demand for superphosphate that it can hardly be supplied. This is because it is difficult and costly to secure vessels for the transportation to the United States of the Spanish pyrites (iron sulphide) chiefly used in the manufacture of sulphuric acid, and our own supply of pyrites is still wholly inadequate. In order to meet the need the output of American sulphur has been greatly increased and the country has been searched from end to end for pyrites. This situation would not be so acute were it not for the fact that such an enormous amount of sul-

phuric acid is required for the manufacture of munitions that the expansion of existing acid plants and the addition of many new ones still fail to supply the full need.

#### IV. POTASH

The potash situation, altho not the most important from a national fertilizer standpoint, is nevertheless acute in special localities, and it is likely to become more so, unless the supply available for fertilizer manufacture is soon notably augmented at prices which the farmer can afford to pay. In view of the circumstance that our supply of potash for agricultural purposes has come in the past almost exclusively from Germany, and the consequent international significance of the potash problem, this phase of the fertilizer question calls for detailed consideration.

There is probably no agricultural question concerning which the present opinions of authorities are so divergent as that of the country's potash requirements for agricultural purposes. This is no doubt due in part to local points of view, arising from the fact that climatic conditions and the characteristics of the soils vary so widely. Further, there is perhaps a greater difference in the requirement for potash on the part of different plants than for nitrogen, phosphoric acid or any other plant food, unless it be lime. While the amount of potash required for tobacco, potatoes, onions, turnips, beets and certain other crops is great, others (wheat, for example) require but little of it on certain clay soils, especially if the straw is utilized and returned to the land in the form of manure.

Unfortunately no other element can more than partially replace potassium in the plant, for it is essential to the formation and translocation of starch and in the synthesis of other carbohydrates. It doubtless per-



forms several other functions which for some plants can be partially, at least, replaced by sodium; altho under normal conditions and at prices existing before the war, it would not have been the part of wisdom to take the risk of loss in yield in the attempt to restrict the potash supply so much that soda could replace it to a practical extent.<sup>1</sup> Again, beets, turnips, radishes and doubtless many other plants will take up far more potash than is necessary to meet their minimum requirements, provided it is present in available form in the soil. In such cases if sodium salts are added to the soil, the plants will take up relatively less potash and more soda than otherwise, without depressing the yield. Sodium thus conserves the soil supply of potash and serves to satisfy a part of the luxury consumption (what the Germans call *Luxusconsum*), or requirement for total mineral ingredients in excess of the absolute minimum requirement of each — a surplus demand which might be satisfied equally well, to a considerable extent at least, with other mineral matter. Soda can doubtless take the place of some potash physiologically in the plant, since it forms soluble salts with certain organic acids which are produced in connection with the synthesis of the proteins.

The following statistical survey of the needs of the various states, which rests chiefly on inquiries made directly by the writer, will serve to show how much potash is required, and for what crops. In view of the importance of the subject and of the differences of opinion to which reference has already been made, presentation of the evidence in detail seems desirable.

Recent investigations by representatives of the United States Department of Agriculture and the Maine

<sup>1</sup> In this connection it is interesting to note that potatoes are somewhat helped by common salt, sodium carbonate, and doubtless by sodium sulphate and other sodium salts, when the supply of potash is inadequate; yet no soda, or no more than traces, may be found in the potato tubers.



Agricultural Experiment Station have shown that already on the type of soil in Aroostook County, Maine, known as the Washburn loam, the potash supply for potatoes is becoming distinctly deficient. This is shown by a peculiar distorting, discoloring or bronzing, and in serious cases by a final blackening and dying of the plants. Fortunately, however, this type of soil is not of wide extent. On the chief soil type of the district, the Caribou loam, the potatoes have not as yet shown the striking characteristics of serious "potash hunger." Nevertheless, according to Director Woods of the Maine Agricultural Experiment Station, the farmers of the state generally will need all the potash they can hope to get at present, and he adds: "There is no question but what on potatoes and root crops in general potash pays agriculturally and financially in this state."

In New Hampshire the Agricultural Experiment Station reports that the relatively heavy clay soils of the state do not require potash for the production of grass, or at least that a dollar expended for potash on the basis of former prices has yielded only a dollar in return. Nevertheless, experiments with grass conducted under the direction of the writer in the southern part of that state, on soils of miscellaneous character, have shown that the use of potash was profitable at the prices which prevailed before the war. Such being the case, there is without doubt a considerably greater need of potash, particularly for potatoes and other vegetables, and for many of the miscellaneous farm crops. Director Brooks of the Agricultural Experiment Station of Massachusetts says that he is "by no means convinced that the use of potash in our agriculture has been excessive." Director J. G. Lipman of the Agricultural Experiment Station of New Jersey is of the opinion that the actual needs of that state for 1918 would be

reasonably met by a supply equivalent to 5,000 tons of muriate of potash. Assuming that New Jersey will require 129,800 tons of fertilizer in 1918, which was the amount used in 1916, the average percentage of potash which should be present in the fertilizers for that state would therefore be 1.93. The most reliable estimates obtainable from other sources for the New England states, New York, Pennsylvania, New Jersey, Delaware, and Maryland place the average required amount of potash at approximately 2 per cent. Using the most authoritative estimates of the fertilizers sold in 1916 as a basis, these states would, therefore, need for the manufacture of the required amount of fertilizer (1,584,255 tons), a total amount of potash equivalent to 63,370 tons of muriate of potash.

According to Dr. Oswald Schreiner and others connected with the United States Department of Agriculture, a considerable part of the early dying of vines in 1917 in the potato districts around Norfolk, Virginia, may have been caused by a deficiency of potash. Early in July, 1917, the writer visited the Norfolk potato region with Dr. Schreiner, but at that time, while there was evidence of serious injury having been caused by something, there were but few positive evidences of potash hunger observable on the potato leaves. This was, however, doubtless due to the lateness of the season and to the fact that the vines on the worst fields were dead and in many cases the crops had been dug. It is quite possible that the conditions which arose, even if caused directly or indirectly by a deficiency of potash, were greatly exaggerated by highly unfavorable moisture and temperature conditions during much of the early part of the growing season, and that they may not be as serious another season. In any event, it is clear there is present or approaching need of much more

potash for the tide-water and trucking regions of Virginia than has been available to the farmers for the past two years. It is stated by Director Johnson of the Virginia Truck Experiment Station that the two counties, Northampton and Accomac, use about 55,000 tons of fertilizer annually. That amount, he says, should contain 5 per cent of potash, but recently it has not contained an average of over 2 per cent. On a 5 per cent basis, the equivalent of 5,500 tons of muriate of potash would be required for those two counties. This would leave, on the basis of the sales of 1916, a balance of 314,520 tons which, on the conservative estimate of 2 per cent as an average potash content of the fertilizer for the remainder of the state, would require the equivalent of 18,081 tons of muriate of potash — or a total requirement for the whole state of 23,581 tons. There was actually used in Virginia in 1917 only the equivalent of 4,500 tons of muriate of potash.

In a recent letter from Professor T. E. Keitt of Clemson College, South Carolina, he speaks of the potash requirement of that state as follows: "I will say that our experimental work does not justify its use for corn or small grains. Under the present conditions it is not advisable to use potash on the heavy clay phases of the piedmont regions for cotton, but on the sandy phases of the southern part of this state potash gives splendid results applied to cotton. Under present conditions I shall recommend the use of only 2 or 3 per cent, but if we had cheap potash I would prefer to use as high as 6 per cent on the section contiguous to our Coast Experiment Station for cotton." The same writer considers potash valuable in that state for the truck crops, and expresses the opinion that about one-half of the total fertilizer tonnage used in the state should contain from 2 to 3 per cent of potash if possible. On the basis

of 2.5 per cent of potash, and assuming the same amount of fertilizer to be needed in South Carolina in 1918 as in the fiscal year ended June 30, 1917 (850,790 tons), there would be required the equivalent of 42,539 tons of muriate of potash. Another highly authoritative statement places the average requirement on a  $3\frac{1}{2}$  per cent basis. On this basis, assuming the same tonnage, the equivalent of 59,555 tons of muriate of potash are needed in 1918. In North Carolina, according to Director B. W. Kilgore of the State Agricultural Experiment Station, more potash was used on many soils before the war than was necessary for economic crop production. The best estimates available place the need for that state at the equivalent of about 30,000 to 40,000 tons of muriate of potash. This represents an average of a little over 2 per cent of potash in a minimum of 800,000 tons of fertilizer which should be used, as compared with the 650,000 tons which were used in 1916.

In Florida, prior to the serious shortage, the average amount of potash in the commercial fertilizers used ranged from 6 to 7.5 per cent, whereas in 1916 it was only 3.28 per cent. It is stated by Director P. H. Rolfs of the State Experiment Station that the average percentage in 1918 should be greater than in 1916. Assuming the same volume of sales in Florida in 1918 as in 1916 (the figures for 1917 are not yet at hand), which is probably far below the actual tonnage which will be sold, there would be required as a minimum in 1918 the equivalent of 20,338 tons of muriate of potash.

In Georgia the sandy soils of the coastal plains require considerable potash, but the piedmont and mountain soils require much less. Professor C. K. McClelland of the Georgia Agricultural Experiment Station estimates that in 1918 there should be supplied

in the fertilizers in southern Georgia an equivalent of about 72,000 tons of muriate of potash, in those for middle Georgia about 24,000 tons and in those for the northern part of the state about 6,000 tons — or a total of 102,000 tons for the entire state. Assuming the view of Professor J. N. Harper to be correct, namely that Georgia should have an average of 3 per cent of potash, there would be required, on the basis of the fertilizer sales in 1916 (741,347 tons), the equivalent of 44,481 tons of muriate of potash. The actual requirement is likely to be much greater in 1918 than in 1916, which would bring these estimates much nearer together.

Employing Professor Harper's estimate for Alabama, there would be required in that state, if the tonnage of fertilizer were the same as in 1916 (206,000 tons), the equivalent of 8,200 tons of muriate of potash.

The views of Professor W. F. Hand of Mississippi are in agreement with practically all authorities in the South to the effect that much more potash was used there before the war than was necessary. This, however, has proved a blessing in disguise, for but little of the amount used was lost by leaching and it is helping materially in the present crisis. Assuming Professor Hand's estimate to be correct, approximately 60,000 tons of complete fertilizer will be needed in Mississippi in 1918. This he estimates should contain 2 per cent of potash, which would necessitate the use of the equivalent of 2,400 tons of muriate of potash. Professor Hand does not attribute the short cotton crop of the last three years to a deficiency of potash, which would be likely to give rise to cotton blight; he accounts for it rather by the activities of the cotton boll weevil.

A report from Director W. R. Dodson of the Louisiana Agricultural Experiment Station is to the effect that potash is practically not required in his state, excepting

in the sections where strawberries and truck crops are grown. He estimates a probable consumption of only 300 to 400 tons of fertilizer containing 2 to 4 per cent. Assuming the maximum tonnage, there would be required on a basis of 3 per cent of potash only the equivalent of 24 tons of muriate of potash.

In writing of Tennessee, Professor C. A. Mooers says that "by constant cropping and the removal of crops, without the return of any fertilizer materials containing potash, it is easily possible to reduce the potash supply on average Tennessee soils to such an extent as to interfere seriously with the production of hay crops. . . . As a rule the potash supply is fairly good throughout the state except for certain areas, in particular the 'barrens' of the Highland Rim and the sandy loams of the Cumberland Plateau." It is the general practice to recommend some potash in fertilizers for trucking crops in practically all parts of the state. By following the good methods of farming in vogue in Lancaster County, Professor Mooers believes that the use of potash would be unnecessary "even on the poorest soils of the state." He nevertheless advocates the use of some potash for potatoes and for hay crops on one-fifth of the area of the state. The total quantity of fertilizer sold in the state in 1916 was 91,128 tons. Assuming that 10,000 tons of this should contain 4 per cent of potash, the percentage suggested by Professor Mooers for hay and potato crops, the equivalent of 8,000 tons of muriate of potash would provide for the needs of the state.

Acting Director Peter of the Kentucky Agricultural Experiment Station says that their experiments "show that Kentucky does not need potash for field crops generally." It has been supposed that truck crops needed it, but the results of experiments in 1917 show that, for a brief time at least, the growers "can get

along very well on a limited supply." In 1917 enough fertilizer tags were sold in Kentucky "to tag about 40,000 tons of fertilizer containing 1 per cent of potash." Assuming as a rough approximation a need of 10,000 tons of goods containing that amount of potash, the requirement for 1918 would be equal to the equivalent of 2,000 tons of muriate of potash.

What Professor Mooers has suggested as a possibility if good methods of agriculture were practised in Tennessee, is supported by the views of Professor C. G. Hopkins of Illinois who holds that potash is not required in that state where live-stock farming is practised and the manure is returned to the land. On certain soils Professor Hopkins states that "at least temporary use of commercial potash salts is desirable and profitable at pre-war prices for potash. These are the peaty swamp lands found in very limited areas widely scattered over northern Illinois, and the much more common poor prairie lands of southern Illinois." He asserts, however, that potash is not needed and is unprofitable even at pre-war prices on either type of soil where the farm manure which can be produced is returned to the land.

The situation in Ohio is most encouraging according to Director Charles E. Thorne of the State Agricultural Experiment Station, for he writes: "I would say that the investigations of this Station indicate that if Ohio farmers would carefully save and properly use their farmyard manure, they would not need to purchase any potash so long as it remains at present prices. My opinion, therefore, is that the actual agricultural potash requirement of our state at present is nil." This conclusion is based on a condition which cannot be brought about at once and it may be questioned if Director Thorne has not overlooked some important special crops in arriving at his sweeping conclusion.



There are large areas of land in Indiana which respond profitably to the use of potash at the normal prices existing before the war. According to Professor A. T. Wiancko, there are in the state about 500,000 acres of black soils which are deficient in potash, including mucks, peaty sands and black sandy loams; half of this area cannot be farmed profitably without the use of potash. In addition there are also considerable areas of "bogus" soil which will produce practically nothing without potash. Professor Wiancko says: "Counting 10 pounds of potash to the acre, the half million acres would require an equivalent of 5,000 tons of muriate of potash." In addition to this deficiency "there are, in the southern part of the state, at least two million acres of silt loam and so-called 'clay' lands that have been badly farmed for many years." This area he says "will respond to potash fertilization even tho there are abundant potash supplies in the soil." It is believed, however, that at the present prices for potash it may be more profitable to do without it. Before the war the equivalent of about 20,000 tons of muriate of potash were used in the fertilizers in the state. Professor Wiancko points out, however, that many farmers should then have used it who used none and others should have used more than they did. For the ordinary clay soils where crop residues are properly conserved and a good system of manuring and fertilizing is in vogue, he asserts that potash is unnecessary.

Professor Patten of the Michigan Agricultural Experiment Station, states that potash appears to be unnecessary "on a large percentage of the soils in this state. On the muck soils and many of the sandy soils, especially where potatoes are grown, potash is more or less of a necessity still." He is of the opinion that if the fertilizers containing potash were wisely distributed, the equivalent



of 1,500 to 2,000 tons of muriate of potash would meet the needs of Michigan in 1918.

The lands of northern Missouri are not generally much in need of potash is the report of Professor M. F. Miller. Potash yields some returns even there, but it is not being recommended now because of the high price. The sandy and gravelly soils of southern Missouri respond far more readily to potash than those in the northern section of the state. On the basis of a consumption of about 70,000 tons of fertilizer in 1917, Professor Miller estimates that the minimum requirement would be met if the equivalent of 700 tons of muriate of potash were available for use in the state in 1918. As regards the Southwest, at present New Mexico, Arizona, and Oklahoma do not appear to require potash. It is held by Professor Fraps of Texas that their ordinary corn and cotton fertilizer should contain only nitrogen and phosphoric acid. According to his estimate the equivalent of 600 tons of muriate of potash would meet the needs of Texas in 1918.

In Nebraska, according to Professor Fred W. Upson, the soils of the state "are generally abundantly supplied with potash and what few experiments have been carried out show that potash does not bring returns." The estimated sale of fertilizers in Nebraska in 1916 amounted to only 500 tons. The soils of Kansas also generally appear to yield enough potash for crops, says Professor R. I. Throckmorton, provided the "farmers keep up the organic content of our soils." He calls attention, however, to the possibility of the need of potash on the sandy types of soils which are devoted to potato culture. Assuming that the amount of fertilizer used in Kansas in 1918 should be the same as it was in 1916 (7,940 tons) and that one-fourth of this should be used for potatoes and contain 3 per cent of potash, the

equivalent of 119 tons of muriate of potash would be required for the entire state.

The estimated total sale of fertilizer in Wisconsin in 1916 was only 5,000 tons, but doubtless the amount was much greater in 1917. The writer had not received any official estimate from Wisconsin of the potash requirement of the state when this article went to press and is therefore dependent upon his own coöperative fertilizer experiments, conducted there for the past three years, for an estimate. It is doubtless true that on the better soils where a good system of animal husbandry is practised, there is little or no present need of potash for ordinary field crops. Many of the reclaimed peat or muck soils, however, unquestionably need it as much as the similar soils of Illinois and Indiana. It is probable also that approximately 50 per cent of the sandy loam potato soils of the state need more or less potash, for an average of a large number of tests made in 1917 under the writer's direction shows that potash to the extent of about 40 pounds (equal to 80 pounds of muriate of potash) to the acre, in addition to liberal applications of nitrogen and available phosphoric acid, yielded approximately 100 per cent on the investment even with potatoes and potash at the present prevailing prices. There is indirect evidence also that some of the more sandy tobacco soils will respond favorably to potash if it is used in conjunction with proper proportions of other plant-food ingredients. Assuming that only one-half of the potato acreage of the state is represented by the somewhat sandy types of soil and that only half of that acreage would respond to potash to the degree mentioned above, and further assuming that only 30 pounds of potash are applied to the acre, there should be used in Wisconsin in 1918 an amount of potash equivalent to 2,175 tons of muriate of potash.

In Minnesota about 280,000 acres of potatoes are grown in comparison with 290,000 in Wisconsin. According to Professor F. J. Alway of the Minnesota Experiment Station, a very large acreage of land in the central part of this state is largely a fine sand or sandy loam. "No fertilizer experiments have been conducted on this except at Grand Rapids and there only in the use of manure in combination with different forms of phosphate." He also states that "experimental fields on the sandy lands in the counties immediately north of the Twin Cities are urgently needed." In the autumn of 1917, the writer visited certain of these sandy potato regions for the purpose of comparing the conditions with those in Wisconsin, and aside from the somewhat less rainfall in Minnesota the conditions are so similar that there is great likelihood that a considerable need of potash actually exists, provided the necessary supply of nitrogen and particularly of available phosphoric acid is used to supplement it properly. This seems probable notwithstanding the rather high total potash content of the soils, for in the case of potatoes especially it is important that there be a liberal supply of potash in readily available form.

It remains to be determined to what extent potash and other fertilizer ingredients may be needed in Iowa but, as has been said of Wisconsin (and the same might also have been stated in regard to Minnesota), doubtless on the better lands where animal husbandry is coupled with a rational system of farming, there is at present little or no need of potash. In some parts of Iowa fertilizers already give good returns but their use is as yet small; in 1916 it reached a total volume of but 5,000 tons.

There seems to be no evidence of need of potash in Colorado, Idaho, Montana, Nevada, North Dakota,

South Dakota, and Wyoming, excepting in a restricted way in certain localities for greenhouse and truck crops, altho it is stated by Professor J. G. Hutton that phosphatic fertilizers are becoming necessary and profitable in some parts of South Dakota.

In southern Oregon, according to Professor H. V. Tartar, sulphate of potash was found helpful to alfalfa but muriate of potash was not. Other facts lead to the conclusion that it was the sulphur and not the potash which was needed, and the evidence to date does not point to any imperative need of potash in that state. What is true of Oregon is also doubtless true of Washington.

As concerns California, Professor John S. Burd of the State Agricultural Experiment Station at Berkeley says, "I have never heard of a single instance in which the use of potash in this state has ever been definitely demonstrated to have produced increased crops." The writer is unable to say at this time whether this also represents the views of the experts in the southern part of the state where citrus culture is of especial importance.

No official estimates have yet reached the writer concerning the potash needs of Arkansas and West Virginia but, assuming that an average content of 1 per cent is desirable, the amount of potash required, based on the sales of fertilizer in 1916, would be equivalent to 2,192 tons of muriate of potash for the present year.

A summing up of the need for potash in the several states, using the minimum statement or the average in the cases where the estimates of different authorities were divergent, shows that, if available, there should be used for agricultural purposes in the United States in 1918 at least 147,243 tons of actual potash (potassium oxide) equivalent to 294,486 tons of muriate of potash

or about 736,215 tons of the crude potash salts now being produced from the Nebraska lakes.

The annual importations of potash for agricultural purposes prior to the war were about 226,000 tons of actual potash in the form of German potash salts, which were equivalent to about 452,000 tons of muriate of potash. It appears, therefore, from the figures given above that the estimated minimum requirement of potash for agricultural purposes in this country in 1918 is much more than half the annual consumption for such purposes prior to the war. It should, however, be borne in mind that for some states, notably Ohio, the estimated amount of potash required would have been greatly increased had those making the estimates been influenced not by present prices but by what the use of potash might accomplish in increasing crop production.

In contrast to this large agricultural requirement for potash in 1918, it should be pointed out that on the basis of our total potash production of the first six months of 1917 for all technical and agricultural purposes the equivalent of muriate of potash produced was but 56,092 tons for the year. Taking into account the probable rate of increase for the last six months it is doubtful if the total production for the entire year was much in excess of 60,000 tons. In other words the output was only about 20 per cent of the requirement for 1918 for agricultural purposes alone. These figures are sufficient to show that every effort should be made to increase our potash output to the utmost or there will be a serious falling off in crops in the near future.

Consider now the potential sources of supply. It is stated that there is in Searles Lake, California, enough potash, if ample means for recovering and purifying it were provided, to supply the needs of the country for forty years. A considerable amount is also available

elsewhere from salt lakes and brines. If all of the potash liberated in the flue dust in connection with the cement industry were saved, it would amount to approximately 87,000 tons of actual potash or the equivalent of 174,000 tons of muriate of potash per annum; and a further amount might be recovered from blast furnaces. The giant kelp of the Pacific coast, alunite, feldspar, leucite, potassic silicates accumulated as waste in past mining operations, beet and cane sugar wastes, distillers' wastes, wool washings, tobacco waste and many other incidental sources of potash exist, which should be utilized in so far as it is economically possible. It is therefore true that we have many undeveloped possibilities of a future potash supply fully adequate for our national needs. But it is obvious that no one of these offers hope of furnishing any considerable amount at prices which will permit of serious competition with German muriate of potash (containing 50 per cent of potash) which can be landed in this country at \$12 to \$15 a ton and still yield a living profit to the producers. The only present hope for an adequate and sufficiently cheap supply of potash salts to fully meet German competition rests on the possibility of the discovery of great deposits of crystalline potash salts in this country, similar to those of Central Germany, Alsace-Lorraine, Galicia, and those claimed to have been discovered in Spain and Abyssinia. The prospect of discovering such deposits in the United States by chance borings is too slight to attract private capital. The undertaking is one which the federal government could and ought to promote.

## V. CONCLUSION

In conclusion it should be stated that the country is facing the greatest shortage of organic ammoniates ever known. Considerable quantities of these are essential in the manufacture of fertilizers in order to keep the goods from lumping and hardening and to maintain them in such perfect mechanical condition that when the farmer is ready to use them they will flow freely through the various machines used in their application. Some fertilizer manufacturers who produce large amounts of organic ammoniates and hence use more than they otherwise would, might substitute for a part of them nitrate of soda, or sulphate of ammonia, or both. But at present these are unobtainable in sufficient quantities to meet the various requirements of the country.

Were it not for the enormous demand for sulphuric acid for war purposes and for the unusual cost for labor and transportation there would be at present an unlimited supply of superphosphate at relatively low prices, but under existing circumstances the prices are necessarily high and it is difficult for manufacturers to meet the urgent demand for it.

The withdrawal of the fertilizer supply of the country for a single year would cut the cotton crop of the South nearly in half. It would be a fatal blow to the farmers and to crop production in the East from Maine to Florida. It would greatly reduce the crop production of Indiana, Ohio, Michigan and other important agricultural states. It would in fact be nothing short of a national calamity.

H. J. WHEELER.

AGRICULTURAL SERVICE BUREAU,  
AMERICAN AGRICULTURAL CHEMICAL Co., BOSTON.



## THE GOVERNMENT AND THE NEWS-PRINT PAPER MANUFACTURERS

### SUMMARY

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THE activities of the Federal government with respect to the news-print paper industry furnish an interesting chapter in economic history, the record of which is not yet complete. During the five year period from 1910 to 1915 conditions in the industry were not altogether satisfactory from the standpoint of the manufacturers. New mills were being built in Canada more rapidly than was necessary to supply the United States market, stocks were increasing and prices were showing a tendency to decline. In an effort to change conditions the leaders in the industry in April, 1915, organized an association which included in its membership most of the manufacturers in the United States and Canada. The management of the association was delegated to a secretary and an executive committee composed of five of the largest manufacturers. A statistical service was instituted and the collection and dissemination of in-



formation of interest to the industry was begun. But the activities of the leaders did not stop here. They desired to control conditions and actively discouraged competition among members by methods which in the opinion of the Federal Trade Commission and the Department of Justice transcended legitimate activities and constituted a violation of the Sherman law.

Such was the situation in the industry when the rise in the prices of news-print paper began in the spring of 1916. At the first signs of this advance newspaper publishers sought the assistance of the Federal government, thereby starting a contest with the manufacturers which has only just been settled and in which at different times the Congress, Federal Trade Commission and Department of Justice have taken a hand. While economic causes were partly responsible for the increase in prices, nevertheless the manufacturers by their activities undoubtedly contributed to the advance and in so doing laid themselves open to governmental action.

## I

### THE FEDERAL TRADE COMMISSION'S INVESTIGATION; ITS ARBITRATION

In April, 1916, a resolution was passed by the Senate directing the Federal Trade Commission to ascertain the reasons for the advance in print paper prices. The results of the Commission's investigation were submitted to the Senate in a preliminary report dated March 3, 1917, and a final report dated June 13, 1917.<sup>1</sup> It will be convenient to state summarily some of the more important general facts concerning the industry brought out by the investigation.

<sup>1</sup> Senate Doc. No. 3, 65th Cong., special session; Senate Doc. No. 49, 65th Cong., 1st session, also printed as Report of the Federal Trade Commission on the News-Print Paper Industry.

The domestic consumption of news-print paper in 1915 was about 1,575,000 tons and in 1916 about 1,774,000, an increase of 12.6 per cent, or nearly double the average annual increase for the five years preceding. Of the quantity consumed, Canada supplied about 23 per cent in 1915 and 26 per cent in 1916, the remainder being obtained from domestic mills. The bulk of the tonnage was consumed by some 2500 daily newspapers, most of whom bought on contracts covering a year's supply. Some of these newspapers used more than 100 tons a day. A relatively small part was consumed by some 17,000 weekly newspapers, which generally purchased their supplies in small quantities from middlemen.

From 1910 to 1915 inclusive the news-print paper industry in the United States had been practically stationary and only the mills advantageously located earned satisfactory profits. In contrast, the industry in Canada grew rapidly during this period and was generally in a prosperous condition. This was due to the fact that the Canadian mills enjoyed natural advantages in respect to cheap wood and cheap water power, both of which are essential to the success of this industry. The removal of tariff duties on imports of news-print paper from Canada in 1911<sup>1</sup> permitted the Canadian mills to enjoy the full benefit of this natural advantage, which during the last decade has amounted to about \$4.50 a ton on the average.

During most of the above period the advantage lay with the publisher. There was an abundance of news-print paper, and prices were low and showed a downward trend. Active competition existed among

<sup>1</sup> This provision of the Reciprocity Act remained in effect, even tho the measure was rejected by Canada. The Tariff Act of 1913 removed the duty on imports of printing paper from all countries, if of a value not in excess of \$2.50 per hundred pounds.

manufacturers not only with respect to price but also with respect to quality and service. In many cases the manufacturers provided storage and cartage facilities, delivering the paper on the publisher's sidewalk. The terms of contracts were liberal and the elastic tonnage specifications and low price of paper caused publishers, as a general rule, to be extravagant and wasteful in its use.

In April, 1915, as noted above, the news-print manufacturers organized an association through which they endeavored to control conditions in the industry. Overproduction and competition among manufacturers were actively discouraged and the terms of contracts made during the last half of 1916 were so changed that all of the expenses of delivery previously borne by the manufacturers were placed upon the publishers.

During the year 1916 important changes occurred in conditions affecting the news-print industry and these changes, as the Commission's reports show, were responsible in part for the rise in the prices of news-print paper. The year was one of unprecedented prosperity in almost all lines of business. This caused a large expansion in the volume of advertising, forcing publishers to increase the number of printed pages of each issue. The circulation of newspapers also increased on account of the interest aroused by the war news. Both factors led to a substantial increase in the consumption of paper.

The large newspapers with their liberal contracts demanded more and more tonnage from the manufacturers, and since they were protected as to price found at first little inducement to effect economies. When their requirements were not satisfied by deliveries on contract they went into the open market and bid against other buyers for additional tonnage. Since they

obtained the bulk of their paper on contract at low prices they could afford to pay high prices for the extra tonnage without materially raising the average cost of their entire supply. Exports of news-print paper also increased on account of the shortage of paper in foreign markets and the fancy prices offered by foreign buyers. The result was that the open market, upon which the large number of small publications depended, was literally starved, and current prices rose rapidly.

The prosperous conditions in the United States and the shortage of paper in foreign markets also led to a greatly increased consumption and exportation of almost all the other grades of paper, resulting in an advance in their prices similar to that which occurred in news-print. There was therefore no inducement for mills to shift machines from these other grades to news-print. The tendency was rather in the opposite direction, since, temporarily at least, profits per ton were often larger on these grades.

Altho the machines running on news-print paper, both in the United States and Canada, were speeded up to the utmost, they were unable to supply the demand, and since it was impossible to build new mills or install new machines in existing mills quickly, output was practically limited to that attainable with the then existing mill equipment. The only new machines to begin operating in 1916 were those the construction of which was well under way before the abnormal conditions arose.

During the first half of 1916 the cost of production in some mills began to increase. In other mills, however, the trend of costs continued downward, so that the average for the United States and for Canada remained about the same as that for the year 1915. Costs were kept down by the fact that the large mills were using wood and other materials bought at the low prices pre-

vailing in 1915 and were curtailing the use of chemicals and color as their cost increased. The increased production also tended to reduce the unit cost. In the second half of 1916, however, there was a general increase in cost, which was accentuated at the close of the year by car shortage and other abnormal conditions. Manufacturers in many instances were unable to obtain deliveries of coal and other supplies on contract and were obliged to make purchases at the much higher market prices.

Many of the larger publishers did not feel the effects of the rising prices until the end of 1916, when their favorable contracts expired. The conditions of the market at this time were most unfavorable to them for negotiating renewals, since a large number of contracts were expiring and panic prices prevailed in the open market. These conditions made it possible for the manufacturers to renew contracts at prices which were excessive as compared with costs and which assured them of very large profits for the year 1917. As noted above, the members of the association were also able to change the terms of contracts so as to throw additional burdens upon the publishers. The seriousness of the situation was intensified by the fact that some companies took advantage of the opportunity at this time to shift their machines to other grades of paper or to sell their mills, forcing their former customers to seek tonnage in the open market.

The scarcity of paper in the open market and the excessively high prices threatened the suspension of the smaller newspapers, and the burdens placed upon the larger publishers by the increase in the contract price meant in many cases heavy losses unless there was a general readjustment in advertising and subscription rates and the prompt adoption of drastic economies.

Some publishers were able to make these changes while others were not.

In connection with its investigation, the Federal Trade Commission endeavored to find some immediate solution for the serious situation confronting publishers at the end of 1916. Since it had no power under the law to regulate prices, relief could only come through the voluntary coöperation of the interested parties. Its efforts to secure such action were at first unsuccessful because of the conflicting interests among publishers and the fact that the manufacturers were not eager to join in any plan which would require them to give up any of their advantage. But when, as is pointed out below, the Department of Justice became active and instituted proceedings under the criminal sections of the Sherman law, the leaders in the industry formulated and presented to the Commission a proposition for arbitrating the question of price, according to which it should find, fix and determine the maximum prices of their output of standard news-print paper for the six months' period beginning March 1, 1917.<sup>1</sup> The Commissioners as individuals consented to act as arbitrators, having first ascertained from the publishers and jobbers interested that they were willing to join in the plan.

<sup>1</sup> The language of the essential parts of this submission was as follows:

"Whereas among manufacturers and publishers there are differences of opinion regarding the increase since January, 1916, in the cost of production of news-print paper in the United States, and regarding the increased prices to which manufacturers are entitled for news-print paper sold for use in the United States for the six months' period beginning March 1, 1917, taking into consideration the increase in their cost of production and other conditions affecting such manufacturers; and

Whereas the undersigned manufacturers are desirous of coöperating in any plan that may be approved by the Federal Trade Commission providing for a more effective distribution of news-print paper among the smaller publishers; and

Whereas the undersigned manufacturers are desirous of submitting these matters to the arbitration of the Federal Trade Commission:

Now, therefore, Each of the undersigned does hereby request the Federal Trade Commission to find, fix, and determine forthwith —

(a) The probable or estimated increased cost of production of standard news-print paper in the United States during the period of time commencing March 1, 1917, and ending September 1, 1917, over the cost of production of news-print paper in the United States during the year 1916.

On March 3, 1917, the Commission announced its award in the arbitration, fixing \$2.50 per 100 pounds as a fair and reasonable price for roll news in car lots, with the privilege of readjustment at the end of three months if conditions warranted. The contract customers of the signatory manufacturers were then asked to sign the following agreement:

With the understanding that the price in my contract with the — company for the purchase of standard news-print paper be reduced to \$2.50 per one hundred pounds f. o. b. mill for the period March 1, 1917, to September 1, 1917, unless readjusted by the Federal Trade Commission after the expiration of three months from March 1, I hereby agree to release each month 5 per cent of the tonnage I have contracted for and authorize the above company to resell the paper thus released under such restrictions as may be imposed by the Commission acting as arbitrator for the purpose of having it go only to publishers who do not now have contracts covering such six months period of time. I also agree that during this period I will not purchase any paper in addition to that already contracted for, unless it becomes absolutely necessary to meet my actual requirements, and in case such additional purchases are made, I agree to report at once to the Commission for each purchase the quantity purchased, price paid, name of seller and reasons for the purchase. Further, I agree during this period to discontinue the privilege of returns and eliminate waste in every way possible. I understand that failure to conform to the spirit of this agreement may result in a forfeiture of the reduction in price.

It was the intention of the Commission to distribute the surplus tonnage released by the contract publishers among the publishers without contracts who were in need of assistance. Many of the contract publishers would have experienced difficulty in releasing 5 per cent of their contract tonnage as required by the agreement,

(b) What price per hundred pounds at the mill would be a fair and reasonable price for the sale of such paper for use in the United States during the aforesaid period of time from March 1, 1917, to September 1, 1917, taking into consideration such increased cost of production and other conditions affecting respective manufacturers which the Commission may deem pertinent at this time."

Report of the Federal Trade Commission on the News-Print Paper Industry, pp. 135-137.



having already had their tonnage for 1917 considerably reduced. Nevertheless a majority of them signed the agreement, so that it looked as if the plan would succeed. The jobbers who distributed paper to the smaller publishers also agreed to coöperate in the plan of relief and signed an agreement with the Commission fixing their rates of profit on the news-print paper allotted to them for distribution.

After the Commission had gone this far with the plan one complication after another arose, which caused delay in putting it into operation and which finally wrecked it altogether. Apparently the manufacturers were dissatisfied with the price determined by the Commission. It also appears that a much larger number of publishers signed the above agreement than was anticipated by the manufacturers so that the reduction in price to the \$2.50 basis on the aggregate tonnage would have caused a substantial decrease in their earnings. A difference of opinion arose between the Commissioners and the manufacturers as to the exact meaning and scope of some of the provisions of the submission. Furthermore, only the contract customers of the seven manufacturers who joined in the agreement would have been directly benefited by it. Some of the newspapers who would not be benefited were large and influential.

Most important of all, the manufacturers in signing the agreement had evidently assumed that the Department of Justice would discontinue the grand jury proceedings against them for violation of the Sherman law. In this they were disappointed, for the Attorney-General, having begun the suit, apparently saw no reason why he should not continue it until a decision was reached. He did continue it, and in April, 1917 secured indictments against the principal signatory manufacturers. After the indictments were brought against

them several of the manufacturers withdrew from the arbitration, claiming that acceptance was optional on their part, and the others did not give their customers the benefits of the reduced prices determined by the Commission.

As the Commission had no power to enforce the agreement, it became a dead letter. Some of the publishers who assented to the terms of the arbitration, however, have since taken the view that they entered into a legal and binding contract with the manufacturers through the agency of the Federal Trade Commission, the consideration being the offer to release 5 per cent of their contract tonnage each month. If this view should be upheld in the courts there is the prospect that the signatory manufacturers may be obliged to return to their contract customers who signed the agreement, the difference between the \$2.50 price and the price actually charged during the six months' period. While no suits for recovery have as yet been brought by publishers, one of them at least, has had the foresight to withhold the difference between the \$2.50 price and the price actually charged, thereby placing upon the manufacturer the burden of bringing suit. The amount involved in this one case exceeds \$50,000, and should all of the other publishers who were parties to the agreement file suits, the amount involved would run into millions.

In addition to its efforts to bring relief through the arbitration agreement, the Commission was able through the coöperation of two manufacturers, the Berlin Mills Company, Portland, Maine, and the Northwest Paper Company, Cloquet, Minn., to give the smaller publishers considerable assistance. These two manufacturers at considerable sacrifice of profits placed their surplus tonnage at the disposal of the Com-

mission at the Commission's price of \$3.25 f. o. b. mill for sheet news-print in car load lots. This was distributed as widely as possible through jobbers and associations of publishers, and altho the tonnage was far from being sufficient to supply the demand, it exercised a potent influence upon the market price in every locality where it was distributed and probably prevented a large number of small publishers from suspending publication.

## II

### PROCEEDINGS BY THE DEPARTMENT OF JUSTICE

In connection with its investigation the Federal Trade Commission obtained a considerable mass of evidence from the correspondence files of manufacturers, tending to show that the leaders in the industry had been actively engaged in suppressing competition. Apparently a tacit understanding existed among members of the association that they would not interfere with one another's customers and it was the secretary's duty to see that this understanding was not violated. In 1915 efforts were made by the leaders to curtail production with the result that the stocks on hand at the beginning of 1916 were smaller than they had been for some time previous. Attempts were also made to prevent or discourage the building of new mills, and the tonnage of two new Canadian mills was prorated among the leaders in order to keep it out of the open market. Various other practices of similar nature were disclosed.

The evidence obtained by the Commission was brought to the attention of the Department of Justice in January, 1917. In view of the nature of the evidence the Commission chose this course rather than proceeding under its own powers as it might have

done.<sup>1</sup> The Department of Justice immediately began proceedings against the manufacturers before a Federal Grand Jury for the Southern District of New York, which found indictments against seven of them on April 11, 1917. These seven indicted manufacturers comprised the five members of the executive committee of the association and two other persons who had been very active in promoting a control of the industry.

The trial of the indicted manufacturers was set for October but was later postponed until November, 1917. When the case came to trial, a settlement was reached with the government. Five of the individual defendants entered the plea of *nolo contendere* and nominal fines were imposed upon them by the court. Conditional on the acceptance of this plea, they signed an agreement with the Department of Justice which provided among other things that the price of their standard news-print paper should be \$3.00 per 100 pounds f. o. b. mill from January 1, 1918 to April 1, 1918, after which date the price and terms of sale of any and all news-print paper sold to publishers in the United States should be determined by the Federal Trade Commission for the duration of the war and three months thereafter.<sup>2</sup> In the case of the Minnesota and Ontario

<sup>1</sup> In dealing with the Book Paper Manufacturers' Statistical Bureau, the Commission proceeded under its own powers, filing a formal complaint against the members of the organization charging them with certain practices in violation of section 5 of the Federal Trade Commission act and ordering them to cease and desist from those practices. The practices complained of, however, were not as effective restraints of trade as those employed by the news-print manufacturers. The book paper manufacturers agreed to disband the Bureau and cease the practices complained of.

<sup>2</sup> This agreement reads in part as follows:

"Second: The price of news-print paper on the basis of 24x36 inches in size weighing approximately thirty-two pounds per five hundred sheets, on all new contracts from now to January 1, 1918, and on all contracts in existence on January 1, 1918, or made thereafter, and on all sales and deliveries, in the United States, shall not exceed the following amounts:

(a) From January 1, 1918, until April 1, 1918, for such news-print paper in rolls, \$3.00 per hundred pounds f. o. b. at the mill in car load lots, and \$3.25 per hundred pounds f. o. b. at the mill in less than car load lots, and for such news-print paper in

Power Company and its subsidiary the Commission was authorized to determine the maximum prices beginning January 1, 1918. Thus after a lapse of some months the Commission was again brought into the case, and for the duration of the war will be engaged in determining maximum prices of news-print paper.

The Department of Justice also filed a petition in equity against the corporate defendants belonging to the association on November 26, 1917, praying for the dissolution of the association as a combination in restraint of trade and in violation of the Sherman law. On the same date the court with the consent of the individual defendants who composed the executive committee rendered a final decree ordering the dissolution of the association and enjoining the members from concerted activities in restraint of trade in the future. The decree of the court was sweeping. It forbade the defendant corporations from entering into an unlawful combination in restraint of trade; declared the News-Print Manufacturers' Association to be an unlawful combination and dissolved it; enjoined the defendants from engaging in any like combination for the restriction of competition, or the establishment of uniform prices by concert of action; and made the injunctions binding upon the officers, directors and agents of the corporations, as well as upon the corporations themselves.

At a meeting held in New York on December 12, the members of the association adopted a resolution ratifying the action of the executive committee, thereby carrying out the decree of the court. A committee was

sheets \$3.50 per hundred pounds f. o. b. at the mill in car load lots and \$3.75 per hundred pounds f. o. b. at the mill in less than car load lots. The foregoing subdivision (2-a) shall not apply to the Minnesota and Ontario Power Co., nor the Fort Frances Pulp and Paper Co., Ltd.; but as to said two companies, the Federal Trade Commission, after due hearing and investigation and subject to review as provided in subdivision 2-b, shall fix the just and reasonable maximum prices and terms of contract for said two companies from January 1, 1918 until April 1, 1918, effective January 1, 1918."

also appointed to prepare plans for a new association which should meet the approval of the Department of Justice.

### III

#### OTHER DEVELOPMENTS

When the efforts of the Federal Trade Commission to bring relief to publishers by the voluntary coöperation of the interested parties failed, it recommended to Congress the enactment of legislation providing for governmental supervision of the production and distribution of print paper and of mechanical and chemical pulp for the duration of the war.<sup>1</sup> These recommendations were as follows:

By reason of this condition, and because of the vital interest to the public of an efficient dissemination of news in this crisis, the Commission recommends as a war emergency measure that Congress by appropriate legislation provide:

(1) That all mills producing and all agencies distributing print paper and mechanical and chemical pulp in the United States be operated on Government account; that these products be pooled in the hands of a Government agency and equitably distributed at a price based upon cost of production and distribution plus a fair profit per ton.

(2) That pursuant thereto some Federal agency be empowered and directed to assume the supervision and control thereof during the pendency of the war.

(3) That, by reason of the fact that approximately 75 per cent of the production of news-print paper in Canada comes into the United States, proper action be taken to secure the coöperation of the Canadian Government in the creation of a similar governmental agency for the same function, which shall be clothed with power and authority to act jointly with the governmental agency of the United States for the protection of the consumers and manufacturers of print paper and the public of the United States and Canada.

(4) That, in case the Canadian Government shall not join in such a coöperative enterprise, then importation of paper and mechanical

<sup>1</sup> Letter of submittal of Report of the Federal Trade Commission on the News-Print Paper Industry, pp. 12, 13.

and chemical pulp into the United States shall be made only on Government account to or through the Federal agency charged with such supervision and distribution.

Bills embodying substantially these recommendations were introduced into both Houses of Congress during the fall of 1917 but the pressure of war legislation prevented any action. At the close of the session, in October, 1917, a bill introduced by Senator Smith, of Arizona, was reported favorably by the Senate Committee on Printing, of which he is chairman. This bill was made the unfinished business of the Senate in January, 1918, and when it came to a vote on January 15 was defeated by a close margin. The House has not yet taken action on any of the bills of similar nature introduced during the present Congress.

The Smith bill would have given the Commission much greater control over the news-print industry than it has under the agreement made by the Department of Justice, which only gives it control over the prices of the few signatory companies. As long as there is a plentiful supply of paper, this power is sufficient for the protection of publishers; but should another period of scarcity occur the Commission would be unable to cope with the situation unless given the power to regulate distribution. The Smith bill would also have given the Commission control over the production and distribution of chemical and mechanical pulp, which is essential to successful supervision since they are the principal materials used in the manufacture of news-print paper.

In carrying out the provisions of the agreement which the manufacturers entered into with the Department of Justice the Federal Trade Commission has prepared a form of cost report which each manufacturer is to file monthly during the life of the agreement. This will



enable the Commission to follow the trend of costs closely and make such adjustments in price as from time to time may seem necessary. Supplementary information relative to the determination of prices will be presented to the Commission by the manufacturers and other interested parties at hearings which have already (January, 1918) begun. The experience of the Canadian Commissioner of paper and pulp in determining news-print prices in Canada indicates that there are some knotty problems to be solved by the Federal Trade Commission in arriving at what is a just and reasonable price for the sale of news-print paper in the United States. The problem is complicated by the fact that it is impossible in the case of some companies to ascertain the actual investment in the business, on account of reorganizations, amalgamations, and the like.

Anticipating the dissolution of the News-Print Manufacturers' Association, the Federal Trade Commission in September, 1917, instituted a news-print statistical service. The manufacturers were required to file weekly reports showing the results of operations and monthly reports showing the distribution of their output and the prices charged. The jobbers handling news-print, and all publishers having a circulation in excess of 5,000 copies, were also required to file monthly reports. A similar service was later instituted for the book paper industry, whose statistical bureau was dissolved in October, 1917. These reports place the government in possession of accurate information regarding the two industries. The results are also summarized and made public at frequent intervals.

Altho the Commission's statistical service has only been in existence a short time it has already been demonstrated that the information is more complete and more accurate and also more expeditiously obtained than that previously collected by the associations.

Some interesting questions are raised by the developments in the news-print paper industry as briefly outlined above. Do they not demonstrate that in the long run it is detrimental to the interests of both publishers and manufacturers to be engaged in a contest, in which during one year one side has an undue advantage and during the next year the other? Avoidance of such abnormal variations in prices and profits in the industry would seem to be advantageous not only to manufacturer and publisher but also to the reading public.

If it was unwise for the newspaper publishers prior to 1916 to push their advantage to the detriment of the manufacturers, was it not equally unwise and shortsighted for the manufacturers, when they had secured the advantage, to exact excessively high prices from the publishers? All the consequences of this policy cannot yet be accurately foreseen. It has already led to a more effective organization of the larger publishers, who are now actively engaged not only in increasing the supply of paper by building new mills and importing paper from Newfoundland, but also in decreasing consumption by the introduction of economies and the elimination of waste in printing. Incidentally the increase in advertising and subscription rates, and the suspension of numerous publications forced by the rising cost of paper, have contributed to the curtailment of consumption. The manufacturers are now confronted by a period of declining prices and rising costs, which if left to run its course may result in substantial losses. In addition they are confronted by the possibility of numerous suits to recover damages and in the case of the leaders by governmental price fixing during the period of the war.

It is worthy of note that one or two independent companies did not follow the policy adopted by the manufacturers in the association, but pursued the much wiser

course of maintaining a reasonable relation between prices and costs, and in so doing have acquired a good will among publishers which will doubtless be of material assistance in keeping their mills running at full capacity when other companies are closing down machines for lack of orders.

The unfortunate experience of the News-Print Manufacturers' Association raises the question whether trade associations which are active in the promotion of the interests of their members are not likely, sooner or later, to run counter to the Sherman law. At present there is not a sufficiently clear definition of the activities which associations may not legitimately engage in. Every association is left free to pursue its course until some trouble arises and the government is brought into the case. But this may be after the damage has already been done. Where associations collect and distribute information regarding production, stocks, prices, the temptation becomes very great for members to extend their activities to the point where in the eyes of the law there is concerted action in restraint of trade.

Other disadvantages of trade associations from the standpoint of the public are that they rarely embrace all of the concerns in an industry, so that the statistics collected are not complete, and since such statistics are available, as a rule, only to the members of the association, these have a distinct advantage in the sale of their product over non-members and the consuming public.

The Federal Trade Commission in its annual report for 1917 recommends as a remedy for abuses arising out of the activities of trade associations that all association files be made public records. It also emphasizes the necessity for having more prompt and accurate information, especially regarding the important basic industries,

and suggests that it is the duty of the government to collect and make available to all interested parties accurate data regarding the production, stocks, prices, of such industries. The success of the Commission's experiments in furnishing a statistical service for two branches of the paper industry indicates that such procedure is entirely practicable as a government undertaking, and it may be expected that as the need for more accurate information regarding various industries is realized the scope of this work will be extended.

E. O. MERCHANT.

WASHINGTON, D. C.

## OUR LARGE CHANGE: THE DENOMINATIONS OF THE CURRENCY

### SUMMARY

Revived interest in small denominations, 257. — The greenback period, 258. — Regulation of denominations in greenback laws, 259. — In the national banking law, 260. — Silver dollars and silver certificates under the Bland-Allison act, 262. — The Silver Purchase act of 1890, 263. — Table, 264. — Treasury notes of 1890, 266. — Developments after repeal of Silver Purchase act, 268. — Gold standard law of 1900, 269. — Developments after 1900, 271. — Act of March 4, 1907, 272. — Discretion granted to national banks, 1917, 276.

THE recent appearance of "greenbacks" in one and two dollar denominations and the repeal by Congress during the last session of the provisions which limited the issue of national bank currency to denominations of five dollars or over have served to attract attention to the changes that have been going on during the past few decades in our money of small denomination — "large change" as Professor Taussig called it.<sup>1</sup> It may be of interest, therefore, to review briefly what has been taking place.

In Professor Taussig's *The Silver Situation in the United States*<sup>1</sup> can be found a study of the general monetary situation in this country as that situation developed under the so-called Bland-Allison act of 1878 down to and including the Sherman Silver Purchase law of 1890. Much detailed discussion concerning denominations and the like is included in Professor Taussig's study, and the present brief survey might, therefore, not inappropriately begin at the year 1890.

<sup>1</sup> The Silver Situation in the United States, 1896.

Yet Professor Taussig's study had a much broader interest than that which constitutes the justification for this paper, and in his study the particular question of our "large change" is, therefore, properly discussed only in its wider implications. The present inquiry is concerned with all the varied readjustments that time and other historical exigencies have made necessary in our small denomination currency, and may begin *de novo* with the Civil War period.

It will be generally recalled that through the suspension of specie payments by banks and by the government, and through excessive issue, the greenbacks depreciated and finally succeeded in driving all metallic money, including fractional money, out of circulation — except on the Pacific coast, where by common consent gold rather than greenbacks were used in general exchange. At that time, however, the Pacific coast was practically an isolated area. The 10 per cent tax on state bank note issues had effectively driven state bank notes from the field. The state bank notes were supplanted, however, by national bank notes, the "cash" reserves for which, in so far as the 5 per cent redemption fund could be regarded as a cash reserve, was made up of greenbacks. The cash reserves against deposit liabilities were also made up largely of greenbacks, altho some of the larger banks regularly kept on hand a supply of gold. The act of February 12, 1873 authorized the coinage of the so-called "trade dollar," intended for exportation to the Orient, where it was to compete with the Mexican dollar. Trade dollars were at first made legal tender within the United States in sums not exceeding five dollars, but the tender qualities were withdrawn in 1876. Only a few got into domestic circulation. Currency in general circulation from the Civil War down to the Bland-Allison act of 1878 was made up, there-

fore, of United States notes or "greenbacks," national bank notes,<sup>1</sup> and a few trade dollars.

The first act authorizing the issue of greenbacks was that of February 12, 1862.<sup>2</sup> It provided for the issue of \$150,000,000 in United States notes, fifty millions of which were in lieu of an equivalent issue of demand notes authorized the year before. The new notes were to be of such denominations as the Secretary of the Treasury might "deem expedient, not less than five dollars each." Demand for currency in denominations below five dollars was presumably to be met partly by such gold as was in circulation and by state bank notes.<sup>3</sup>

A further issue of one hundred and fifty millions in greenbacks was authorized by the act of July 11, 1862.<sup>4</sup> This act provided that the Secretary of the Treasury might use his discretion in determining the denominations, provided that no notes were issued for the fractional part of a dollar, and that not more than thirty-five

<sup>1</sup> Demand notes issued in five, ten, and twenty dollar denominations from August, 1861, to March, 1862 to a total of fifty millions, which were redeemed in gold, are not specifically mentioned because when greenbacks depreciated, the demand notes disappeared from general circulation as promptly as gold itself.

<sup>2</sup> Publications of National Monetary Commission, vol. ii, p. 165.

<sup>3</sup> The coinage of silver dollars, stopped in 1805, was resumed in 1836. Some were coined in 1837 and 1838, but from 1839 down to the demonetization of silver in 1873, there was only one year (1858) when some silver dollars were not coined. The amount coined, however, was small, exceeding a half million dollars per annum only in 1859 and 1860. See U. S. Treasury Circular No. 52, pp. 52-60. Gold was steadily coined at the government mints despite the war. Total coinage of gold during the war was as follows:

1860 .....	\$23,474,653
1861 .....	83,395,530
1862 .....	20,876,007.50
1863 .....	22,445,482
1864 .....	20,081,415

Most of this gold stayed in the hands of the banks, however, and did not appear in circulation.

State bank notes in denominations under five dollars had for decades been a source of trouble, and attempts were made to suppress them. They were needed, however, and despite frauds and losses public opinion seems to have sustained them. See Davis R. Dewey, *State Banking Before the Civil War* (Pub. Nat. Mon. Com., vol. x, pp. 63-79).

<sup>4</sup> Pub. Nat. Mon. Com., vol. ii, p. 639.



millions were in denominations lower than five dollars. By joint resolution, January 17, 1863,<sup>1</sup> Congress authorized a further issue of one hundred millions to pay the men in the national forces. Express authority was given to the Secretary of the Treasury to prescribe the denominations, "not less than one dollar." Similar authority was given to him in the act of March 3, 1863,<sup>2</sup> which permitted a net addition of fifty millions to the issues already authorized.

It will thus be seen that in the legislation authorizing the issue of the greenbacks there was at first absolute prohibition of denominations below five dollars. Then a concession was made in the authorization of a specified amount of low denomination bills. This was in turn followed by a lifting of all restrictions and by a grant of discretionary power to the Secretary of the Treasury in determining the denominations. The objection to small bills was little more than a prejudice carried over from state banking experience which had demonstrated that notes of small denominations not only tended to remain long in circulation but also tended to get more persistently into the hands of the poor and the ignorant than did the bills of larger denominations, so that in case of failure of the issuing bank, the weak and the defenseless were the harder hit. It is difficult to see how this probably rational objection to notes of small denomination issued by state banks had any bearing on the notes issued by the national government itself, especially in view of the fact that even the state issues of small denomination seem to have been vindicated in popular opinion.

The law of February 23, 1863, which established the national banking system, also prohibited issue of notes under five dollars. This law was superseded, however,

<sup>1</sup> Pub. Nat. Mon. Com., vol. ii, p. 641.

<sup>2</sup> *Ibid.*, p. 644.

by the act of June 3, 1864, which authorized the issue of banknotes in denominations of one, two, three, five, ten, twenty, fifty, one hundred, five hundred, and one thousand dollars. But again there was an important proviso, namely, "that not more than one-sixth part of the notes furnished to an association (national bank) shall be of a less denomination than five dollars, and that after specie payments shall be resumed, no association shall be furnished with notes of a less denomination than five dollars."<sup>1</sup> It would therefore appear that Congress believed that as soon as specie payments were resumed the bulk of the circulating medium in small denominations getting into the hands of the great mass of people should be jingling specie. The act of February 12, 1873 provided for the coinage of one dollar, two and a half dollar, and three dollar gold pieces, and the old silver dollar was completely dropped as one of the authorized coins. Hence in 1873 the specie that Congress had in mind for the small denominations must have been gold itself. But, of course, during the period of suspension the greenbacks and the national bank notes had to be relied upon. Down to 1879, when the issue of one dollar and two dollar national bank notes was discontinued, the total issues of one's equaled \$23,169,677, and of two's \$15,495,038. As the privilege of issuing notes in denominations below five dollars was not restored to national banks until October, 1917, the small notes began in 1879 gradually to disappear from circulation.<sup>2</sup> United States notes in one and two dollar denominations outstanding at the close of the fiscal year in 1878 totaled \$41,840,822.<sup>3</sup>

During the period of years from 1878 to 1890 when the Bland-Allison act was in force, the coinage of silver

<sup>1</sup> Pub. Nat. Mon. Com., vol. ii, pp. 340-345.

<sup>2</sup> See table, pp. 264, 265.

<sup>3</sup> See table, pp. 264, 265.

dollars, and toward the end of the period the issue of small denomination silver certificates, constitute the most interesting phases of the "large change" development. The act of February 28, 1878 (the Bland-Allison act) provided for the coinage of silver dollars as described in the act of January 18, 1837.<sup>1</sup> The dollars were to be full legal tender at nominal value "except where otherwise expressly stipulated in the contract." The Secretary of the Treasury was required to purchase not less than two nor more than four million dollars worth of silver a month and to coin it "as fast as purchased, into such dollars." Section 3 of the act provided that silver dollars might be offered to the Treasury in exchange for silver certificates in denominations "of not less than ten dollars each, corresponding with the denominations of the United States notes." The certificates were made "receivable for customs, taxes, and all public dues" and when so received could be reissued. The certificates were also made redeemable in silver on demand.

The purchase of silver bullion and the coinage of standard silver dollars began as soon as the act went into force. The Secretaries of the Treasury used the discretion accorded to them to keep their purchases down to the two million mark, but, as a glance at the table will show, the minting of the dollars went on steadily and the number that got into circulation increased rapidly. Silver certificates were issued at first only in the larger denominations, but the act of August 4, 1886, authorized the issue of one, two, and five dollar certificates and the exchange of such small denomination certificates for the larger denominations. This act was suggested by the monetary emergency which prevailed at the time. Surplus reserves had accu-

<sup>1</sup> *Pub. Nat. Mon. Com.*, vol. ii, p. 579.

mulated in the banks, which had discriminated against the silver currency, especially in the East. Hence the tendency was for the silver dollars and the silver certificates to flow back to the Treasury. In the hope of keeping silver currency permanently in circulation, the Secretary of the Treasury in 1885 used the discretion vested in him with respect to the issue of greenbacks to stop the issue of denominations below five dollars.<sup>1</sup> That this was effective is shown by the fact that by the following year the one and two dollar greenbacks in circulation dropped over fourteen millions while the silver dollars made a corresponding gain. There was, however, a marked preference in various quarters for paper bills, hence the enactment by Congress of the act already referred to authorizing the issue of the small denomination silver certificates. The extent to which these small denomination certificates entered into general circulation is disclosed in the table.

The Sherman Silver Purchase law of 1890 included several provisions affecting small denomination currency. It withdrew from the Secretary of the Treasury the discretion in the purchase of silver bullion that had been vested in him by the Bland-Allison act, and required him to purchase four and one-half million ounces of silver bullion each month at the market price as long as the market price did not exceed \$1 for 371.25 grains. In payment for such silver the secretary was to issue treasury notes "in such form and of such denomination not less than one dollar nor more than one thousand dollars, as he may prescribe." The notes were made redeemable in either gold or silver coin, at the discretion of the secretary, the law stating that it was the "established policy of the United States to maintain the two metals on a parity with each other upon the present

<sup>1</sup> See Taussig, *op. cit.*, p. 30.

## MONEY OF SMALL DENOMINATIONS OUTSTANDING

Year	U. S. notes or greenbacks			Silver certificates			National bank notes	
	One dollar	Two dollar	Five dollar	One dollar	Two dollar	Five dollar	One dollar	Two dollar
1878	20,930	20,911	54,070	....	....	....	4,060	2,820
1879	18,210	18,093	54,107	....	....	....	4,017	2,800
1880	20,332	20,353	65,483	....	....	....	2,687	1,886
1881	22,646	22,244	69,569	....	....	....	1,564	1,093
1882	25,721	24,623	67,343	....	....	....	913	608
1883	27,736	25,524	71,150	....	....	....	628	393
1884	26,660	24,898	75,553	....	....	....	512	299
1885	24,952	25,295	75,998	....	....	....	455	251
1886	17,604	18,204	85,629	....	....	....	418	221
1887	8,797	9,009	95,065	13,979	8,906	7,728	398	205
1888	5,180	4,977	81,055	26,732	18,597	51,610	391	200
1889	3,715	3,351	58,335	27,908	20,238	85,580	377	190
1890	3,292	2,873	57,730	31,134	22,558	102,127	371	185
1891	3,390	3,316	57,527	29,065	19,234	110,070	367	182
1892	4,062	3,081	61,594	27,312	17,130	102,432	363	179
1893	3,396	2,852	62,202	22,855	16,023	94,002	360	176
1894	3,052	2,470	52,785	22,281	15,366	87,652	357	174
1895	3,185	2,580	54,321	27,242	16,667	88,263	355	172
1896	3,126	3,334	57,897	29,440	15,788	93,975	353	171
1897	3,073	2,849	57,475	31,064	18,123	101,736	351	169
1898	2,488	2,125	63,999	30,902	18,776	109,377	350	169
1899	2,261	2,112	73,798	40,742	22,902	106,895	349	168
1900	2,132	1,900	77,056	52,222	30,839	114,005	348	167
1901	2,040	1,675	51,393	59,356	36,500	175,709	347	167
1902	1,986	1,560	30,159	67,694	39,877	233,623	346	166
1903	1,949	1,505	18,214	79,300	44,590	264,025	346	166
1904	1,921	1,470	11,865	80,707	45,191	231,842	345	165
1905	1,899	1,447	8,649	90,105	48,189	284,972	345	165
1906	1,886	1,433	6,943	101,020	47,172	298,924	344	165
1907	1,875	1,421	6,620	108,051	55,024	289,605	344	165
1908	1,861	1,408	75,316	112,806	56,044	263,629	344	164
1909	1,850	1,396	87,965	124,141	56,280	246,010	344	164
1910	1,843	1,388	114,790	140,819	59,762	243,561	344	164
1911	1,837	1,382	151,748	150,477	60,579	224,543	344	164
1912	1,831	1,375	169,050	161,327	62,854	227,178	344	164
1913	1,827	1,371	194,808	178,855	66,160	219,065	344	164
1914	1,823	1,367	202,997	179,680	63,907	209,370	343	164
1915	1,820	1,364	202,123	174,838	59,749	182,869	342	164
1916	1,816	1,358	230,674	203,364	65,943	194,822	342	163
1917	11,712	10,261	227,647	215,103	63,565	176,129	342	163

## OUR LARGE CHANGE

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AT CLOSE OF FISCAL YEARS, 1878-1917. (IN THOUSANDS)

National bank notes	Treasury notes of 1890				Total one, two, and five dollar currency	Total all denomina- tions	Silver dollars minted	Silver dollars in cir- culation	Gold dollars minted	Year
	Five dollar	One dollar	Two dollar	Five dollar						
93,909	.....	.....	.....	.....	197,299	765,069	22,496	855	3	1878
95,977	.....	.....	.....	.....	193,204	723,931	27,500	7,654	3	1879
100,578	.....	.....	.....	.....	211,260	726,228	27,397	10,309	2	1880
99,962	.....	.....	.....	.....	217,079	770,864	27,928	23,828	8	1881
97,450	.....	.....	.....	.....	216,828	789,790	27,574	31,991	5	1882
93,594	.....	.....	.....	.....	219,016	887,926	28,470	35,342	11	1883
87,250	.....	.....	.....	.....	215,171	917,895	28,137	39,795	6	1884
81,172	.....	.....	.....	.....	208,124	974,043	28,698	38,471	12	1885
83,283	.....	.....	.....	.....	205,360	921,431	31,424	52,470	6	1886
78,116	.....	.....	.....	.....	222,204	902,624	33,612	55,506	9	1887
72,427	.....	.....	.....	.....	261,108	986,241	31,991	55,545	16	1888
59,166	.....	.....	.....	.....	259,859	992,737	34,652	54,418	31	1889
52,014	.....	.....	.....	.....	272,286	1,004,887	38,043	56,166	.....	1890
47,568	3,516	3,141	10,096	.....	287,472	1,056,417	23,563	57,083	.....	1891
49,691	6,262	8,676	23,247	.....	303,929	1,140,426	6,333	56,799	.....	1892
51,354	13,299	12,360	36,936	.....	315,815	1,109,430	1,456	57,030	.....	1893
61,510	12,829	10,346	33,819	.....	292,644	1,170,692	3,094	51,191	.....	1894
64,370	11,051	8,712	40,422	.....	317,339	1,138,316	863	51,983	.....	1895
70,959	11,617	9,790	42,630	.....	339,082	1,120,539	19,877	52,176	.....	1896
73,093	11,786	8,930	36,175	.....	344,725	1,169,788	12,652	52,001	.....	1897
71,416	15,901	10,782	30,876	.....	357,161	1,139,339	14,427	57,260	.....	1898
73,800	12,512	8,842	32,664	.....	377,134	1,144,207	15,183	63,382	.....	1899
74,540	5,459	4,971	27,153	.....	390,790	1,380,833	25,011	66,429	.....	1900
61,569	2,185	2,014	16,537	.....	419,491	1,473,144	22,567	66,588	.....	1901
54,620	1,119	954	9,158	.....	441,369	1,534,897	18,161	68,747	76	1902
61,799	771	613	5,035	.....	478,313	1,654,374	10,344	72,391	175	1903
62,827	627	477	3,057	.....	490,495	1,774,623	8,813	71,314	25	1904
68,473	548	404	2,123	.....	507,320	1,835,620	578,354	73,584	35	1905
76,889	496	357	1,659	.....	537,288	1,953,392	Total	77,001	19,809	1906
113,827	463	324	1,355	.....	579,075	2,111,438	.....	81,710	Total	1907
147,594	434	298	1,144	.....	661,044	2,345,087	.....	76,329	.....	1908
136,436	411	278	960	.....	656,236	2,378,787	.....	71,988	.....	1909
139,864	395	262	842	.....	704,036	2,419,553	.....	73,433	.....	1910
140,679	384	251	756	.....	733,143	2,538,607	.....	72,446	.....	1911
141,665	374	242	688	.....	777,003	2,619,173	.....	70,340	.....	1912
143,752	366	235	632	.....	807,578	2,681,034	.....	72,127	.....	1913
137,196	360	230	585	.....	798,022	2,674,740	.....	64,647	.....	1914
137,882	354	225	544	.....	793,652	2,967,246	.....	64,647	.....	1915
116,944	350	221	508	.....	873,470	3,509,153	.....	66,415	.....	1916
114,317	342	210	479	.....	940,219	4,209,835	.....	71,825	.....	1917

legal ratio, or such ratio as may be provided by law." For approximately one year (until July 1, 1891) after the passage of the act the secretary was required to coin monthly two million ounces of the bullion into standard silver dollars, but thereafter only so much of the bullion was to be coined as might be necessary to redeem silver certificates.

The operation of the Sherman Silver Purchase law is now an old story. The currency was inflated at a time when the public revenue fell off, and doubt arose as to the possibility of the treasury maintaining at a gold value all the silver that poured into the circulation. Through the operation of an "endless chain" of redemption the Treasury repeatedly lost gold. During the fiscal year 1890-91, as the Treasurer of the United States remarks in his report,<sup>1</sup> "there was a net loss of forty-nine millions of gold, with a net gain of nearly forty-two millions of other money." During the following year, the increase in the currency was nearly double the average for the ten-year period 1880-90.<sup>2</sup> By April, 1893, the gold reserve in the Treasury dropped below \$100,000,000 and the issue of gold certificates was suspended. The object of the suspension was to prevent people from presenting greenbacks and treasury notes for redemption in gold and then depositing the gold for gold certificates. When the issue of gold certificates was suspended, whatever gold came to the Treasury for exchange was paid for in notes and so strengthened the gold reserve.<sup>3</sup> In November, 1893, the Sherman Silver Purchase act was repealed.

The issue of treasury notes of 1890 in denominations under five dollars is shown in the table. A considerable

<sup>1</sup> Report of Treasurer, 1890, p. 12.

<sup>2</sup> *Ibid.*, 1891, p. 17.

<sup>3</sup> *Ibid.*, 1893, p. 9.



volume of these small notes remained in circulation until 1900. Large quantities would flow into the Treasury for redemption from January to June each year, but would be reissued during the last six months of the year, when the demand for hand-to-hand media, especially in the smaller denominations, tends to increase. The national bank notes in denominations under five dollars were practically a negligible quantity. In 1890, however, to try to keep them steadily in circulation, the reissue of small greenbacks was undertaken, and this issue continued down to 1898, by which time the emergency generated by the Sherman Silver Purchase act had passed. That it was the large denomination currency rather than the small notes which played the sinister part in the depletion of the government's gold reserve is shown in the following table, compiled from United States Treasury Reports, 1890-93:

Denominations	Issued during year	Redeemed during year	Net increase	Net decrease
1890				
\$10 and under .....	131,252,000	82,802,204	48,249,796	
Over \$10 .....	113,890,000	124,740,364		10,850,364
1891				
\$10 and under .....	134,168,417	97,192,396	36,976,021	
Over \$10 .....	176,340,000	143,603,720	32,736,280	
1892				
\$10 and under .....	149,591,593	121,302,541	28,289,042	
Over \$10 .....	227,135,000	177,112,610	50,012,390	
1893				
\$10 and under .....	173,486,106	155,035,940	78,450,166	
Over \$10 .....	170,545,000	225,841,550		55,296,550
Total .....			132,965,025	(\$10 and under)
			16,601,756	(Over \$10)

The coining of standard silver dollars dropped off greatly in the fiscal year 1891-92. This was due to the fact that the Sherman law required coinage, after July 1, 1891, only of so much of the silver as was needed

to redeem treasury notes presented for redemption. As the Treasury had adopted the policy of redeeming all kinds of currency in gold if gold were asked for, the demand in the redemption of treasury notes as well as of the other kinds of currency was for gold.<sup>1</sup> The silver dollars in circulation, as indicated in the table, remained approximately the same.

After the repeal of the Sherman Silver Purchase law in 1893 the situation, in so far as the small denomination currency is concerned, developed normally. The country was, of course, torn by the free silver controversy, but this had no special influence on the relation of small denomination currency to the larger. The channels of free interchange between large and small denomination currency were kept open. This is an important point in real elasticity of currency. Not only must there be flexibility in the volume of the currency but also in its denominational composition. Since all the currency under five dollar denominations was issued directly by the government itself, the burden of denominational elasticity had to be borne by the Treasury. Thus in his report of 1900 (p. 21) the Treasurer of the United States points out that:

"The Treasury is called upon every year to provide small denominations of paper to facilitate the movement of crops. A large part of this business is done by the deposit of funds with the Assistant Treasurer in New York for which payment is made by the Assistant Treasurer in New Orleans, St. Louis, or Chicago, respectively. In addition to the transfers through the Treasury, banks ship considerable sums to their correspondents by registered mail. . . . These conditions do not indicate

<sup>1</sup> For example: In the last three months of the fiscal year 1891-92 the Sub-treasury in New York lost \$18,214,433 in gold and in net exchange for \$6,589,925 in greenbacks, \$9,873,985 in treasury notes, under two millions in gold certificates and the balance in national bank notes and silver certificates.

a lack of currency or of credit. The pressure is for particular denominations, those less than \$20 and, in very large measure, those of \$5 and below." Then as the small bills began to flow back to the banks large denomination bills were sought in exchange. This ebb and flow affected even the silver dollars. The outward flow of silver dollars was facilitated by the government because the Treasury paid their cost of transportation, but not that of paper currency.

The prosperity which characterized the latter part of the decade 1890-1900 stimulated an increasing demand for small denomination currency. In his report of 1900, the Treasurer (p. 21) notices that "In previous years, after the season's demands, haste has been exhibited to seek large notes in exchange for the smaller ones whose work is done. During the past twelve months this exchange has not reached previous proportions, but the Southwest and West have kept the currency, paid for the crops, and the Treasury has put out the largest denominations in decreasing ratio."

The gold standard act of March 14, 1900 had certain special provisions relating to the small denominational currency. Of course all the money in circulation was affected by the fixing of the gold dollar as the standard of value and by the requirement that all kinds of money be kept at a parity with this standard, but there were special provisions bearing on the volume and character of small bills. Section 5 of the act provided for the cancellation of the treasury notes of 1890. As fast as silver dollars were coined it was enacted that equal amounts of the treasury notes should be canceled. It was also provided that against the silver dollars so coined, silver certificates should be issued. Section 7 provided that after the passage of the law not more than 10 per cent of the total volume of silver certificates

should be issued in denominations over ten dollars, and that as long as this percentage was actually exceeded in practice certificates of large denominations should be replaced with those of small denominations whenever for any purpose the large denomination certificates were received by the Treasury. But this provision went further. It required the Treasury to fill the resulting gap left in the large denomination bills through a corresponding transformation of United States notes or greenbacks from denominations below ten dollars into those above that level.

As parts of the gold standard law the reasons for these provisions are not difficult to find. A fixed gold reserve of 150 millions was provided for the greenbacks, and those presented for redemption would be again paid out only in exchange for gold. If necessary, bonds were to be sold to keep the gold reserve from dropping below 100 millions. Hence the security of the greenbacks seemed established, and the possibility of their being again used in an endless chain process of draining gold from the Treasury was eliminated. They could therefore be safely confined to large denominations. There was, however, no special gold reserve for the silver certificates. They rested upon bullion which in terms of gold was declining in value. Their position manifestly needed whatever additional support could be provided. Experience proved that bills of small denomination tended on the average to remain in circulation longer than did those of large denomination. They were needed in actual exchange and were but infrequently employed in obtaining gold from the Treasury. Hence the obvious purpose of the gold standard law was to direct the whole currency demand for denominations below five dollars toward the silver currency. The quarter eagle, which alone definitely maintained its status, was hardly a factor in

general circulation. Similarly, owing to the restriction on the national bank notes, most of the five dollar bills in actual circulation were also expected to be silver certificates.

The soundness of this procedure is hardly open to question, but it left one thing out of account, namely the probability of an increased need for the smaller denomination notes with a limited supply of silver certificates to draw upon to meet such need. Yet almost at once the demand for the small denomination currency increased. The gold standard law had hardly been passed before complaints were heard that the supply of small bills was inadequate. In his report of 1900 (p. 15) the Treasurer states that "Since March 14 no issue from the Treasury has been made of such large denominations (silver certificates above ten dollars) but the return for redemption or in payments has been slow. Gradually they will be presented and will disappear, and their places will be taken by smaller denominations. These are much sought after from all parts of the country. Indeed requests are not infrequent that they may be furnished in return for gold."

From 1900 on, the demand for the small bills gradually increased. The demand is great from July to December and then recedes from January to June. In the active months the worn-out notes and those of large denomination are presented for redemption in small bills. The volume of these operations is referred to as follows by the Treasurer (Report, 1900, p. 16):

"To one who has not had the matter forced upon him, the immense mass of paper redeemed in the course of a year is nothing less than marvelous. . . . The paper issued directly by the government, owing to the broader use of smaller denominations, which wear out sooner than larger ones, reaches the division of redemption in

active months in the year compared with each other in an ever rising flood."

In 1902 the Treasurer remarked (Report, p. 152): "The demands of the people for notes of small denominations have surprised the closest students of the currency." He then points out that while in 1900 the average value of the paper currency issued by the government was \$6.613, by 1902 it had been reduced to \$4. By 1904 the Treasurer waxed even more eloquent. Witness the following:

"Experience in all recent years makes clear that the supply of small notes is hardly equal to the demand. . . . No rule can be set up by theory of the proper ratio of the several denominations to each other. The needs of business must be recognized and obeyed. Those needs clamor vociferously for small bills as instruments of local trade. The appeal is not confined to any particular district. It comes from the cotton and sugar regions as well as from the states which produce wheat and corn, cattle and swine. Cities and towns where the pay rolls for factories and furnaces are large assert the same urgency."

The Treasurer then adds that "Congress has it within its power to add to the volume of small denominations without inflating the currency." He recommended the issue of gold certificates in five and ten as well as higher denominations; the return to small denomination United States notes and the repeal of the law limiting the issue of national bank notes in denominations below five dollars.

In response to repeated recommendations of the Treasury, Congress passed, and on March 4, 1907 the President approved, a law aimed among other things to remedy the small bill difficulty. Section 1 of the act authorized the issue of gold certificates in denominations

as low as ten dollars instead of twenty dollars as provided in the gold standard law of 1900. The object of this authorization was to release ten dollar silver certificates and United States notes in order that they might be broken up into smaller denominations. In previous treasury reports attention had been called to frequent requests for small denomination bills in exchange for gold or gold certificates. Section 2 of the act authorized the Secretary of the Treasury to issue United States notes in denominations of one, two and five dollars, whenever in his opinion the supply of silver certificates in those denominations did not equal the demand. An equal amount of higher denomination greenbacks was, of course, to be retired. This restored to the Secretary of the Treasury the discretion that he had enjoyed down to the gold standard law of 1900. The gold standard law was based on the theory that the silver certificates had to be buttressed on the demand side, hence the monopolization for them of the largest part of the currency demand, namely that in the small denominations. But, as already indicated, it took only a few years to demonstrate that it was on the supply side that the small bills needed support. The demand for small bills tended almost steadily to increase after 1907. As was to be expected, the panic in the fall of 1907, with the attendant withdrawal of funds from the banks stimulated the demand unduly. In the fiscal year ending June 30, 1907, the increase in the bills from one to ten dollars was 4.8 per cent. In the following year the increase jumped to 12.9 per cent.<sup>1</sup> Thereafter the demand increased less rapidly, and, down to the outbreak of the Great War, no particular comment seems to have been elicited from the Treasury concerning the readjustment of the various denominations to meet changing demand.

<sup>1</sup> Report of Treasurer, 1908, p. 173.



During this interim a few of the developments are noteworthy. With respect to the greenbacks the policy of the Treasury was apparently to emphasize especially those of five dollar denomination. Notwithstanding the 1907 enactment, as the table will disclose, the one and two dollar greenbacks steadily diminished to the close of the fiscal year ending June 30, 1916. On June 30, 1907, five dollar greenbacks outstanding equaled \$6,620,115.<sup>1</sup> By 1916 the volume had increased to \$230,674,145. It was the silver certificates that were mainly relied upon to meet the demand for one and two dollar denominations. But during the fiscal year ending June 30, 1917, advantage was taken of the authority to issue the small denomination greenbacks. During that year there were issued \$10,304,000 one dollar greenbacks, and \$9,216,000 in the two dollar denomination. The fives and tens were largely drawn on to meet this need.<sup>2</sup>

Another development of some interest is the gradual reduction in the circulation of the standard silver dollars after 1907. Their circulation rose to its maximum in that year. To encourage the circulation the government had for years paid the transportation expenses on shipments of silver dollars whenever these coins were asked for. This entailed considerable expense, and several United States Treasurers grumbled about such coddling of silver. But by April, 1908, the appropriation for this free transportation of the silver dollar was exhausted and was not thereafter renewed. The shipping expense then devolved upon the consignees. The effect that this had upon the demand for silver dollars is disclosed in the following tables of shipments:

<sup>1</sup> Report of Treasurer, 1908, p. 231.

<sup>2</sup> Ibid., 1917, p. 69.

Shipments of silver dollars for the months indicated.<sup>1</sup>

	1907	1908
April.....	\$2,532,904	\$533,200
May .....	2,346,227	490,650
June .....	2,664,964	771,125
July .....	2,738,346	797,530
August .....	3,791,269	1,089,600
Sept.....	5,262,743	1,524,500

The shipments by fiscal years are shown in the following table.<sup>2</sup>

1906 .....	\$41,562,828	1910.....	14,384,734
1907 .....	37,500,118	1911.....	14,060,535
1908 .....	31,466,911	1912.....	11,841,874
1909 .....	11,865,180		

After 1912 the average shipments remained about twelve millions.

The Great War has of course profoundly affected the world's monetary arrangements. Before the outbreak of hostilities there had been a feverish accumulation of gold reserves by the European central banks. Credit was contracted, people everywhere were apprehensive, and strong tendencies toward hoarding both of specie and of currency were evident. This condition was reflected in an increased demand for hand-to-hand exchange media, especially gold and silver coin. While this demand was most pronounced in Europe, it was noticeably felt also in the United States. The actual precipitation of hostilities brought the situation to a climax. Practically all the belligerents suspended gold payments and initiated a more or less thinly disguised policy of bank note inflation. In the United States the issue of emergency currency and the organization of the Federal Reserve system sufficed to meet the pressure,

<sup>1</sup> Report of Treasurer, p. 178.

<sup>2</sup> Compiled from Reports of Treasurer.

except in the field of foreign exchange, where for a time matters were serious. However, the favorable development of our foreign trade soon began to attract gold to this market, and by the time we ourselves were drawn into the struggle our gold resources were unprecedentedly strengthened.

Since our own definite entry into the war the demand for small currency has not abated. War demands and the expansion of credit have steadily advanced prices. Larger sums are needed to effect the exchanges and the other operations dependent upon the use of hand-to-hand currency. In 1914 the Treasurer of the United States recommended to Congress what his predecessors had recommended, namely, the issue of gold certificates in five dollar denominations and the repeal of the provisions limiting national bank note issues to denominations of five dollars and above.<sup>1</sup> By 1917 the pressure had become severe enough to stimulate Congress to action. This pressure was mainly exerted by national banks in the West and South which asked as far as denominations were concerned for the privilege of exercising their own discretion in the issue of their notes. Congress yielded by repealing the provisions already alluded to, and the national banks are now free to issue their notes in any denominations that serve the convenience of their clients.

It is not probable that the national banks as a whole will avail themselves broadly of their new privilege. In times past the banks in the large centers have but partially employed their note-issue power. Moreover, the reluctance to issue notes of denominations as low as five dollars was so widespread that on several occasions the Treasury made special efforts to get the banks to issue a larger amount of their five dollar quota. But the coun-

<sup>1</sup> Report of Treasurer, 1914, p. 326.

try banker, who in the active seasons feels most severely the demand for small bills, is now to some extent fortified to meet it.

In the long run, to the extent that the fixed elements in the currency did not suffice to meet the demand for small denominations, it would have been better to rely upon Federal Reserve notes. They constitute now the elastic element in our currency, and as long as a member bank is sufficiently supplied with rediscountable paper it is possible for the bank to obtain the currency that it needs. But as elasticity implies flexibility in the constituent denominations as well as in the total volume, Congress will have to authorize the issue of the reserve notes in denominations below five dollars before these notes can be said to be completely elastic.

EUGENE E. AGGER.

COLUMBIA UNIVERSITY.

## THE FOUNDERS, THE MOLDERS, AND THE MOLDING MACHINE

### SUMMARY

The production of castings recently changed from primitive methods by the introduction of molding machines, 278. — Skilled journeymen at first indifferent, 281. — Laborers were used for operation of the machines, 283. — Subsequent change in policy of Molders' Union, 286. — Skilled men on the machines not successful, 287. — The Union and the National Founders' Association unable to make satisfactory terms, 290. — After cessation of negotiations Founders continued to introduce unskilled labor with success, 297. — The Union modified its membership policy to take care of unskilled workmen, 304.

THE manufactures of iron fall into three general classes: cast iron, wrought iron, and steel. The present paper deals with some recent problems connected with the manufacture of cast iron.<sup>1</sup>

Castings are made by preparing a pattern of the object, usually of wood, and imbedding this in a matrix of sand or loam of such a composition as will retain the shape into which it is pressed. The mold thus formed is made in two or more parts, later clamped together, with only a small hole or gate through which the metal, reduced to a fluid state in the furnace or cupola, is poured. When cool, the casting is shaken out from the sand, is cleaned, and is then ready for whatever finishing processes are needed. The general industry of cast-

<sup>1</sup> The expansion of the automobile industry in the last few years has brought a great demand for brass and aluminum castings. Steel castings are a still more recent development in the trade. The census includes these in its classification of foundry and machine shop products; the National Founders' Association is open to foundrymen in all branches of the industry and the Union claims jurisdiction over all molders. The present study, therefore, deals in reality with the entire field of molding. Altho the Union in 1907 changed its name from Iron Molders' to International Molders', the former title will be retained in the present discussion.

ing metal is called founding, the workers are molders, the proprietors of the shops are founders or foundry-men, and the shops themselves are foundries.

Sometimes foundries are adjunct to factories, and make only the castings needed for the finished products of the machine shop. Sometimes they are not connected with any other establishments, but do a general machinery and jobbing business independently or on contract from concerns which have no foundries of their own. Sometimes they are large or small specialty shops turning out standardized products ready for the market. Sometimes they combine all three of the features just described. Foundry and machine shop products are classed together in the census. They are for the most part mutually dependent, however, hence the data there presented are significant as indicating in a way, the importance of founding. In 1909, foundry and machine shop products were the second most important manufacturing industry in the United States, in both the number of wage earners employed and in the value of the finished goods. Not including such distinctive articles as cash registers, calculating machines, sewing machines, electrical machinery, etc., there were 531,011 wage earners and the products were valued at \$1,228,475,000.<sup>1</sup> July 1, 1912, 4,949 foundries were reported in the United States making steel, gray iron and malleable castings. If brass and aluminum castings are added, the total in 1912 was 5,996.<sup>2</sup>

The technical development of few industries was so long retarded as was founding. For many years, manufacturers were content with a shed and the most primitive implements. The main essential in the production of castings was thought to be a group of skilled artisans.

<sup>1</sup> Thirteenth Census of the United States, 1910. Abstract, pp. 440-442.

<sup>2</sup> *The Foundry*, vol. xl (August, 1912), pp. 329, 330.

The molder was supreme. He was supposed to be core-maker,<sup>1</sup> molder and cupola tender all in one. He cut over his own sand, shook out and cleaned his own castings, and had very little to work with except iron, fuel, sand and a few simple tools. Tho rough and dirty, molding was a highly skilled trade requiring considerable technical proficiency, and in which the processes, many of them apparently simple, demanded long training and experience. A man had to know how to treat his sand so as to get a mixture just suitable for withstanding the heat and force of the molten metal. He had to set the cores accurately and ram the sand around the pattern so as to get a true and substantial matrix. Drawing the pattern so as not to break the mold was a very delicate process and any resulting imperfection had to be carefully patched. The mold had to be properly vented to allow for the escape of gas arising when the metal was poured. The iron, melted to white heat in the cupola, was poured by the molder who carried his own ladle from furnace to mold. In the process, if the mold was not properly made, an explosion might occur or pieces of sand might break loose and run in with the iron, or the metal might not flow freely and evenly, thus leaving unjoined portions; or it might shrink internally, causing holes and spongy places. In any of these circumstances, the casting was imperfect; his time and the material had been wasted.

True, even at this time all foundry work did not demand the same degree of skill. The making of small and light flasks on the bench has always required less of the molder than patterns so large and complicated as to necessitate their being bedded directly in a pit of

<sup>1</sup> Cores are made of sand and placed in the molds to form interior openings or holes in the castings when the pattern itself does not allow for these. Molding and core-making, tho closely related, have long been considered by the workmen to be separate trades.



sand or loam in the floor. Floor molding, especially if the design is worked out in loam with a sweep, requires the highest skill in the trade, and is, because of the position of the worker, arduous besides. Bench molders, on the other hand, making the smaller patterns, turn out in a given time, a larger number of castings. Machinery and jobbing work usually takes the best mechanics in the trade. Specialty work, of which there are some fifty varieties,<sup>1</sup> is to a large extent repetitive, and demands a varying range of ability.

The first attempts to substitute mechanical devices for the molder's skill were crude and attracted little attention. But the inventors persevered and when finally the time came that molders were not to be had except at wages beyond the average employer's reach if at all, and then on terms he found distasteful, the producers of foundry machinery were ready to equip his shop with all sorts of appliances intended to relieve him of his dependence on human labor. The result is a foundry differing in many respects from that just described.

Not without a struggle has this change been brought about. Indeed, scores of foundries can still be found in which primitive methods prevail, or in which only a slight advance has been made.<sup>2</sup> This, however, is not peculiar to founding. Nor is it peculiar that one of the most difficult problems developed in the march of progress has arisen from the attitude of the workers in the industry. It is natural for those long trained to a skilled trade to be apprehensive of the rapid and unrestrained introduction of those forces which they fear

<sup>1</sup> T. D. West, quoted in *Iron Molders' Journal*, 1911, p. 270; *ibid.*, 1913, pp. 19, 42.

<sup>2</sup> The Committee on foundry methods of the National Founders' Association estimated in 1916 that not more than 25 per cent of the foundries of North America have taken advantage of the available mechanical appliances. N. F. A. Service Bulletin No. 1, Chicago, 1916, p. 3.

will eventually take it away from them. So it has been in the foundries. As one mechanical improvement after another has come, and the molders have seen that their skill was becoming of ever lessening importance to their employers, they have tried to ward off disaster in such ways and by such means as have seemed at the time expedient.

The Iron Molders' Union has naturally taken the lead in protecting the workers' interests. This organization, numbering in recent years perhaps fifty thousand members<sup>1</sup> is one of the oldest of the existing trade unions, and is known to be one of the best managed, most effectively officered and adequately financed. Its local branches, of which there are several hundred, decide upon its national rules and elect its national officers. A general policy once formulated, uniform dues and benefits once established through convention vote or referendum, it is the national officers' duty to see that the law is carried out.

In 1899 the Union made an agreement with the National Founders' Association,<sup>2</sup> composed of about five hundred of the more important employers in the industry, to arbitrate disputes and thus do away with the evil effects of strikes and lockouts. It was the expectation of each organization that a set of mutually acceptable working rules would soon be evolved which would standardize conditions in the trade, and make it possible

<sup>1</sup> Membership of the Iron Molders' Union is very difficult to estimate because of its fluctuation in response to the ebb and flow of industrial prosperity. The organization itself no longer makes public its exact numbers. Since 1907 it has been represented in the American Federation of Labor on the basis of a membership of approximately 50,000, of which about 47,000 are in the United States. This is a little more than one-third of all the persons in the trade over which it claims jurisdiction. Leo Wolman, "The Extent of Labor Organizations in the United States," in *Quarterly Journal of Economics*, vol. xxx (May, 1916), pp. 488, 489, 619. In February, 1917, the editor of the Journal made some calculations on the basis of a 50,000 membership. *Journal*, 1917, p. 93.

<sup>2</sup> See also article by the writer, entitled "The National Founders' Association" in *Quarterly Journal of Economics*, vol. xxx (February, 1916), pp. 352-386.

to legislate annually at one conference on all matters related to wages and shop practice. These standard rules were never adopted, however, largely because of the fundamental and unalterable difference of opinion between the two sides as to the introduction and operation of machinery and the development of specialized processes.

Mechanical devices had been introduced in the foundries long before the Iron Molders' Union and the National Founders' Association adopted their arbitration agreement. Some of them, such as the squeezer, a simple appliance for packing the sand, and the stripping plate for helping to withdraw the pattern without breaking the mold, were hand tools which for years the molders had used as a part of their regular equipment with no idea that either of them constituted a special kind of machine over which there should be jurisdictional disputes.<sup>1</sup> How unimportant machines were prior to 1890 is clearly shown by the small number of pages devoted to descriptions of them in the various manuals of molding published before that time.

About 1890 the first Tabor machine, designed to ram the sand by a method far superior to anything then in use, and operated by power, was put on the market. This was followed by machines which drew the patterns, then by others which combined the ramming and pattern drawing. Some of the power machines were profitable only when hundreds of castings from the same pattern were to be made, but others could be used to advantage for a lesser number, and many were adapted to fairly complicated work. Bright young laborers who had never been trained in hand molding

<sup>1</sup> Bolland, *loc. cit.*, p. 147; N. E. Spretson, "A Practical Treatise on Casting and Founding," p. 234; E. Treiber, "Foundry Machinery," translated and revised from the German by Charles Salter, p. 25.

began to operate the simpler types of machines, advancing gradually until even the most difficult patterns were made under their supervision. The brains which formerly had vested in the molder were transferred entirely, through the efforts of engineer and pattern maker, to the machine.

The heartiest coöperation was met with from the men who were thus given an opportunity to better themselves. They were more than satisfied. If day rates were paid, their wages exceeded those of helpers and gangway men. On piece work, the almost universal method of paying for molds made on the machines, they could double the earnings they had received at their former employment. In addition, they enjoyed a quite definite psychic income accruing from the fact that they were now mechanics, makers of castings instead of mere common laborers. They were strong, they were used to hard work, and operating the machines was no more arduous than the tasks to which they had been accustomed.

It must be understood that molding machines, instead of being labor saving devices in the sense that they made easier the work of the molder, often necessitated a material increase in effort by the man who operated them. The time was actually saved in making any one mold, the fact that more molds were produced meant that there was more sand to shovel, there were more molds to lift, more molds to pour, more castings to shake out. That is to say, if a man without a machine turned out six castings, but thirty with it, he had to perform all the preliminary labor necessary to making twenty-four additional molds, and by just that much was the other labor incidental to the molding process increased.<sup>1</sup> If

<sup>1</sup> A typical case is that of a certain job made on the bench and paid for at the rate of seven cents per flask. Sixty molds, necessitating ten ladles of iron, paid \$4.20. Put on the machine, the price was set at two and three-fourths cents per flask, which would

these extra operations were performed by laborers and machinery, as has more recently been the case, the molding machine operator became himself a mere machine, with none of the variety to his work which characterized the skilled hand worker.

The few foundrymen who experimented with the machines were delighted with the results. Their labor cost was reduced because of the use of laborers at wages far less than those paid to journeymen, and output was enormously increased. In addition, machine drawn castings were found to be more uniformly true to pattern, which meant less grinding and machine shop work, and therefore easier and less expensive finishing. Machine used patterns showed less wear and tear than patterns used on floor or bench. And, probably more important than any other consideration to the employer, the installation of molding machines lessened his dependence on journeymen mechanics. Machines having been invested in, the working force in a foundry could be changed with but little inconvenience, for the skill required for molding was still present in the wood and metal of the machines, while new operators were easily broken in.

Curiously enough, the molders paid almost no attention to the machines during the early stages of their introduction into the foundries. They seem to have been entirely indifferent, as if nothing had occurred that affected their trade or their interests. So firmly convinced were they that no harm could come to them through the introduction of machinery, as had been the case with numerous other trades, that they scorned all offers of an opportunity to operate it. They believed

mean for the same daily pay, one hundred and sixty-five flasks to mold and twenty-eight ladles of iron to carry, together with one hundred and sixty-five flasks to shake out. The Journal characterized this as "enough labor to put any man out of business." *Journal*, 1907, p. 215.

molding would always require manual dexterity and the use of human intelligence and reasoning power. It could not be reduced to terms of a machine.<sup>1</sup>

Yet the use of molding machines steadily increased. By 1900 nearly 10 per cent of the total molding force employed by the National Founders' Association were machine operators, despite the fact that 62 per cent of the work made in its members' foundries was general foundry work, engines and machine tools, which branches are the least adapted to machine molding.<sup>2</sup>

The officers of the Union by this time had come to look facts squarely in the face. They saw their trade slowly slipping into the hands of laborers. They saw perfect castings being produced without the expenditure of any particular skill upon them. And they decided that the Union's policy in this matter must be changed, that the original attitude of scorn and ridicule had been a grave mistake, short sighted and unprofitable. It had not prevented the introduction of machines; machines were turning out molds; and if the Union did not now control them, the machines would soon displace the molders.<sup>3</sup>

Their problem was the twofold one of guarding against future danger and of repairing the damage which had already been done. So strongly was this situation emphasized by the Union's officers at the 1899

<sup>1</sup> E. g., *Journal*, 1896, p. 65. William H. Sylvia, the first president of the Union, in trying to impress upon his constituency the desirability of making the trade an honored occupation through maintaining standards of skill, said "our trade is only in its infancy in this country and it is one of those trades that can never be interfered with by machinery for the reason that it requires a *thinking machine* to make castings." *Proceedings*, Iron Molders' Union, 1866, p. 12.

<sup>2</sup> Data furnished by the secretary of the Association from the reports of members for the last quarter of 1900. This estimate does not include coremakers. See also *Quarterly Journal of Economics*, vol. xxx (February, 1916), pp. 370, 381.

<sup>3</sup> President's address to the convention of the Iron Molders' Union, 1899. *Proceedings*, I. M. U., 1899, pp. 10, 11; *Journal*, 1899, pp. 395-397. See also frequent discussion of the subject in subsequent numbers of the *Journal*, and *Proceedings*, I. M. U., 1907, pp. 9 ff.

convention, that a report with the following recommendations was endorsed unanimously: *first*, that the future policy of the Union should be to seek to establish jurisdiction over the molding machine operator and all those who work in the various subdivisions of the trade of molding; *second*, that they advise and instruct their members to accept jobs on molding machines and to endeavor to bring out their best possibilities; *third*, that the officers of the organization ask the coöperation of the foundrymen in forwarding the plan, and in other ways seek to devise means of putting the new policy into effect.<sup>1</sup>

This complete change of front was made by a representative convention of the Iron Molders' Union, but in attempting to carry it out there developed a very difficult situation. The habit of indifference had been too long ingrained in the rank and file. They refused to operate the machines, and bitterly opposed the change.<sup>2</sup> Foundrymen, on their part, had become accustomed to laborers at the machines, found them entirely satisfactory, and were loath to allow the molders an opportunity to demonstrate their own superiority. But when these obstacles had been overcome and the members of the Union finally took their places at the machines, unsatisfactory results almost always followed. The output was not nearly as great as the employer thought it should be; the machines manifested a persistent tendency to get out of order. The journeymen after a few days' trial were always wanting to return to hand work. In addition, they expected to receive the pay which had been theirs as hand molders. The upshot of the matter usually was, that after thousands of dollars had been invested in machines, in a few weeks they were relegated

<sup>1</sup> Proceedings, I. M. U., 1899, pp. 75, 101, 112, 165, 166; Journal, 1899, p. 397.

<sup>2</sup> E. g., letter in the Journal, 1899, pp. 412, 413.



to the shed or the yard and no more attempts were made in that particular foundry to carry on machine molding.<sup>1</sup> Or, if the employer persisted in his use of the machines, and returned to laborers as operators, they were promptly taken into the Union and the Union proceeded to help them secure "a wage commensurate with their output and skill."<sup>2</sup>

There is no doubt that many skilled molders, put to work on the machines, did not honestly try to bring out their best possibilities. On the other hand, even when they did, results were not satisfactory. For instance, one foundryman reported that he had five molding machines operated by molders and two by laborers, and in each case the class of work was identical. The molders on their machines turned out from seventy-five to one hundred molds a day; the laborers made from one hundred and seventy-five to two hundred.<sup>3</sup> Another employer had sixty-seven machines. On sixty-two, small work was made and laborers were entirely satisfactory. On the five machines making the larger molds, they lost about 50 per cent of the castings and could not seem to get the knack of the process. When journeymen were put on, there was no loss from imperfect work, and furthermore, the output was increased. It was distinctly understood, however, that the molders were to leave the smaller machines entirely alone.<sup>4</sup>

There are several obvious reasons for the employers' lack of satisfaction with journeymen on the machines. In the first place, the position of the Union was that its

<sup>1</sup> Journal, 1903, pp. 11-14. See also United States Commission on Industrial Relations, Hearings at Washington, D. C., Tuesday, April 7, 1914 (MS.), vol. i, p. 256; vol. ii, pp. 581-588, 615.

<sup>2</sup> Proceedings, I. M. U., 1902, p. 617.

<sup>3</sup> Report of the Officers, N. F. A., November, 1902, p. 50.

<sup>4</sup> Proceedings, N. F. A., November, 1901 (MS.), pp. 93-100.

members as well as the manufacturers should benefit by whatever improvements were introduced. Thus, if payment was by the piece, the same rate should prevail for machine as for hand molded castings. Or, if the day rate method was used, as the Union at that time greatly preferred, there was, it was thought no justification for the employer's insistence upon a lower wage rate because the molding was now done on machines instead of by hand. No reason has ever appeared to the Union why its members should work harder or receive a lower proportional rate on the machines than at hand molding.<sup>1</sup> The value of the machines to the manufacturer is largely determined by the amount of labor and skill they eliminate from the molding process.

Again, skilled molders had not been trained to the heavier work made necessary by the machines; their apprenticeship had been served to brain and not to brawn. It was inevitable that their output should be inferior to that of men whose work on the machines was easier than that to which they had been accustomed; who, far from having any prejudice against it, since they had never known any other method of molding, were enthusiastic over its use, and felt their best interest to be akin to that of their employers in getting the most out of the machines.<sup>2</sup>

<sup>1</sup> Hearings (MS.), vol. i, p. 314.

<sup>2</sup> "The reasons for the journeyman molder not to produce a maximum output on the machine are two: first, Union affiliation undoubtedly has created in the mind a dislike for and prejudice against the machines; second, he lacks a positive incentive to operate the machines to the best advantage. He anticipates no increase in his earning power — the reward is negative. The laborer is promised a large increase in his earning capacity if he gets the most out of the machine — the journeyman molder is promised employment at a less remunerative work or no work at all if he does not operate the machine to its full capacity.

"For the reasons stated above, it is doubtful whether a non-union journeyman would make a better success as a machine operator than a union journeyman. The fundamental problem is one dealing with human nature perhaps as much as with union labor. Any journeyman has through long years become so accustomed to certain fixed standards of a day's work that he finds it difficult to adjust himself against all inclination and active prejudice to new standards of output largely exceeding the old. Inquiry

Journeymen had everything to lose by the introduction of machinery — their trade, their skill and their pay — with much harder work in the bargain. Indifference on the part of many developed into active opposition, as employers, trade papers, and molding machine manufacturers constantly set before them the possibility that in the near future the new inventions were so to supplant the skilled mechanics that they would soon be superfluous encumbrances in the foundries.

At first, foundrymen were willing to let union molders take a turn at the machines if they so desired. They never for a moment regarded it as the molder's right, however, and of course expected that a much larger output would result than had been possible under the old hand process. When they found that journeymen would never go on machines if there were hand work to be done, that there was very little if any increase in output, and that the same rate was demanded for machine as for hand molding, they ignored the Union entirely and went back to the system of freely employing unskilled men on the machines.

Only a few months after the Union had voted to coöperate with the manufacturers in the introduction of machinery, tho after a long enough time had elapsed to demonstrate that the interests of employer and union employee were essentially divergent, the National Founders' Association adopted a resolution that they would use their own judgment as to who should operate the machines; that when it seemed skilled molders would do the best work as was sometimes the case, they

in non-union shops where both floor and machine molders are employed develops the fact that it is difficult, even thus when not encountering union prejudice against the machine, to get a man accustomed to floor or bench work to put up a full day's work on the machine." *Stove Founders' National Defense Association. Report of the Committee on Machinery, 1906, pp. 13, 14. See also Proceedings, N. F. A., November, 1905, in The Review, December, 1905, p. 43; ibid., February, 1910, p. 6; United States Bureau of Labor, Bulletin No. 67 (November, 1906), "Conditions of Entrance to the Principal Trades," p. 714.*

would be employed, but that the whole thing was a matter of shop practice quite outside the scope of any arbitration agreement, and that "molding machine operators should not be considered molders in any agreement entered into. . . ."<sup>1</sup>

It seems evident that whereas in the beginning the Association did not conceive of the Union's machine policy as one designed to limit output, a few months' experience caused a reversal of judgment.<sup>2</sup> Members believed they must be free to use the machines as they pleased; the high minimum wage demanded by journeymen, combined with their great scarcity during the period of business activity which characterized the years from 1899 to 1903, made necessary the introduction of whatever practices would make for less dependence on that class of labor.<sup>3</sup> Desirable members were being lost to the Association because they feared negotiation with the Union would deprive them of their prevailing or contemplated use of machines.<sup>4</sup>

It will be easily understood that the Association's arbitrary removal of the machine issue from the purview of their joint agreement, just after the Union had voted to enlist the Association's coöperation in working out a mutually acceptable policy, met with vigorous opposition from the Union. The first clash came at the now famous Detroit Conference of June, 1900. Said the National Founders' Association:

Inasmuch as the molding machine is the product of the machine shop and not of the foundry, it is not under the jurisdiction of the molder, but having been produced at the expense of the employer, there shall be accorded to him the right to operate it in whatever

<sup>1</sup> Proceedings, N. F. A., February, 1900, p. 35.

<sup>2</sup> Ibid., August, 1899; *ibid.*, February, 1900, p. 39.

<sup>3</sup> Proceedings, Conference between the National Founders' Association and the Iron Molders' Union of North America, Detroit, October, 1902 (MS.), p. 14.

<sup>4</sup> Proceedings, N. F. A., February, 1900, p. 38.

manner he may elect, the same as his right to operate his power plant, cranes or any other mechanical devices which have been brought into the foundry for the better prosecution of the employer's and molder's joint interest.<sup>1</sup>

The Molder's counter proposition was:

That inasmuch as the molding machine is but an improved tool designed to increase and cheapen the product of the molder and represents both additional capital invested by the foundryman in his business, and a different method of applying and utilizing the capital (his labor) of the molder, we recognize that each is mutually interested in the manner of its operation.<sup>2</sup>

The Detroit conference ended in a deadlock and was soon followed by one of the most bitter strikes in the history of the industry. The settlement of this, after more than seven months of struggle, served only to confuse the machine issue. Among other things, it was stipulated:

That the right of the foundryman to introduce or operate molding machines in his foundry shall not be questioned. In determining who shall operate them, regard should be given to the question of how their best possibilities can be brought out, and how the work can be most economically produced.<sup>3</sup>

But it was also agreed that in applying the principle of the minimum wage, "operators of molding machines who have not learned the general trade of molding" were not to be considered.<sup>4</sup> This was regarded by both officers and men of the Union as strictly in accord with the ruling of their recent convention, and as in no wise relinquishing their interest in the machine question.<sup>5</sup> Members of the Association, on their part, interpreted

<sup>1</sup> Proceedings, Conference, Detroit, June, 1900 (MS.); Journal, 1900, pp. 384-387.

<sup>2</sup> Ibid.

<sup>3</sup> Proceedings, Conference, Cleveland, February, 1901 (MS.); Journal, 1901, pp. 133-135.

<sup>4</sup> Proceedings, Conference, Cleveland, February, 1901 (MS.); Journal, 1901, pp. 130, 131, 196, 197.

<sup>5</sup> Proceedings, Conference, Cleveland, June, 1901 (MS.); Journal, 1901, p. 403.

it as a surrender to their point of view and tried to use it as a precedent for introducing and operating machines at will, without consulting the Union at all.<sup>1</sup> As a result the Union became more seriously concerned than before over the machine issue, and found it necessary to repudiate on every occasion this statement of their machine policy.

The Association's attempt to remove the molding machine issue from joint control with the Union was only slightly successful during the years 1899 to 1903. With business booming and a larger proportion of molders in the Union than ever before, employers had little choice as to their machine policy. While it is true that the national union showed no tendency to support a subordinate group in its opposition to the introduction of machines, help was frequently given when locals were trying to persuade foundrymen to allow their members to show what they could do. Some of the local contracts of the time are interesting as an indication of the expedients resorted to for the purpose of harmonizing conflicting opinions.

One way of getting around the difficulty was to call the unskilled non-union machine operators apprentices, even tho, because of the prevalence of a fixed ratio in some foundries, this necessarily reduced the number of legitimate learners of the trade.<sup>2</sup> In

<sup>1</sup> Report of the President, N. F. A., May, 1901 (MS.), pp. 5, 6; Proceedings, N. F. A., May, 1901 (MS.), pp. 80-85, 91.

<sup>2</sup> An agreement signed in July, 1901 illustrates this:

"Whereas . . . it appears that this employment of a laborer on the molding machines has given rise to some irritation in the shop of the ——— Co., through a misunderstanding on the part of the molders, and also the further claim on the part of the Iron Molders' Union of North America that the question of the use of molding machines by inexperienced labor had not been definitely settled between the National Founders' Association and the Iron Molders' Union of North America, at the solicitation of Mr. Valentine, first Vice-President of the Iron Molders' Union of North America, that the ——— Co. remove the machine or the laborer working thereon in order to allay any feeling that its use may have engendered in the shop of the company, the ——— Co. has consented to call the laborer engaged on the machine an apprentice, and to accept him as such, and under this name to operate the machine for the present. The ——— Co. agree to make

another instance an arrangement was made whereby molders were to run machines with flasks more than twenty-four inches square or with an area exceeding 24" x 24", while laborers or unskilled molders were to work on machines with flasks less than that size.<sup>1</sup> Still others required that molders be given first choice as machine operators, and provided for joint determination of the piece or time rate.<sup>2</sup> All of these makeshifts were obviously unsatisfactory so long as no generally acceptable policy had been agreed upon. The persistent demands of the Union for a voice in the determination of a matter the Association considered beyond its power was a source of continual grievance to the latter; the Union was confessedly panicky over the fate of the trade.

In 1902, the national union, having failed to persuade the locals to help enthusiastically in the development of the machines by operating them fairly and bringing out their best possibilities as determined in the resolution of 1899; not entirely comprehending the Association's position in the matter, yet realizing that larger and larger groups of unskilled men were daily turning out satisfactory castings on the machines, resolved to extend the organization to these men. The experiment of forming a special local of machine operators had been tried in the autumn of 1901, and met with such success that their wages were raised and conditions generally were bettered. They were represented at the

this change solely in the interest of peace, and under the special condition that none of their rights to operate molding machines in their foundries by inexpert labor or machine operators are thereby waived or relinquished or forfeited in any manner. And furthermore, it shall not be used as a precedent in any future conference or settlement of the question." *Agreements with Foundrymen, 1901. I. M. U., Miscellaneous Records (MS.).*

<sup>1</sup> Report of the Officers, N. F. A., November, 1902, p. 50.

<sup>2</sup> Agreement between Unions Nos. 19 and 24, and the Henry McShane Mfg. Co., December 31, 1902 (MS.); Agreement between the National Foundrymen's Association of Pittsburg and the Iron Molders' Union of Pittsburg and Vicinity, no date (MS.); Agreement between the Gould Coupler Co., Depew, N. Y. and the Iron Molders' Conference Board of Buffalo and Vicinity, January 1, 1902 (MS.).



convention of 1902.<sup>1</sup> On the basis of this trial and because of the Union's urgent need to get control of the machine operators, who otherwise seemed in a fair way to walk off with the trade entirely, the 1902 convention amended the Union's admission requirements so as to include any molder who had served an apprenticeship of four years or worked at the trade four years "in any of its branches or subdivisions."<sup>2</sup> The executive board later decided not to grant an active card to machine operators until they had served their full time.<sup>3</sup> But even with this special membership, they were regarded as an integral part of the Union in every way.

From then on, the organization of machine operators progressed rapidly and made increasingly trying the relations between the Union and the Association. Each subsequent attempt to reach a uniform agreement on the machine matter — and there were many — only ended in a deadlock, for neither side receded from its original position in the least. Just as it appeared that the interests of the two organizations were so antagonistic as to make any reconciliation out of the question entirely, the industrial tide turned, the panic of 1903 was reflected almost at once in a lessened demand for molders and the Association lost no time in taking advantage of this situation to release themselves from a situation they had come to find intolerable. The arbitration agreement of 1899 was abrogated by the Association in 1904, and since then no negotiations whatever have been held between the two parties to the original contract.

From this brief account of the struggle of the Iron Molders' Union and the National Founders' Association

<sup>1</sup> Proceedings, I. M. U., 1902, p. 617; Journal, 1902, p. 403.

<sup>2</sup> Proceedings, I. M. U., 1902, p. 754; Constitution, I. M. U., adopted 1902, Article VIII, Section 1; Journal, 1902, pp. 531, 532.

<sup>3</sup> Proceedings, I. M. U., 1907, p. 28.

over the introduction and operation of molding machines, it must appear that one fundamental issue, and only one, was involved on each side. There was, in the policy of the national union, no matter what the attitude of the rank and file, no hostility to the machines. Its officers were agreed with the National Founders' Association, that machines should be used. They were equally concerned to say when and under what circumstances. The Association was insistent in its support of those members who considered it their privilege to introduce machines at will. The Union was organized to protect its members in the sale of their labor, and this meant that they must control the ways in which the molding process was carried on. The Association, in order to enable its members to attain the greatest efficiency in their business, had to guarantee them its absolute control in their own hands. The two theories are so irreconcilable, it seems doubtful if any satisfactory permanent arrangement could ever have been reached, even with the complete coöperation of the local unions, which apparently was not given during the period in which attempts were being made to bring this about.

One factor not generally understood is worthy of emphasis in this connection. Almost from the beginning of the industry, it has been the custom of the trade to recognize a "set day's work." When a pattern came into the shop, a few pieces were made from it and the foreman then fixed the time that normally would be required to make similar castings in the future. From then on, each man making pieces from that pattern was supposed to conform to the established "set." When the Iron Molders' Union came to be important in the foundries, the amount of the task or "set" became the subject of agreement between the shop committee and

the foreman, but this was obviously only a formal recognition of what had always been a legitimate practice of the trade.<sup>1</sup> Thus, the hand worker had, through long years' practice, become accustomed to turn out so much and no more as a day's work. It is entirely possible, indeed quite likely, that journeymen trained to the hand trade and its speed, could never adapt themselves with entire satisfaction to the machine process; that for most of the molding machine work, unskilled men who had never had any other experience, who had no prejudices to live down or trade tricks to unlearn, would make the more successful machine operators.

After relations between the Iron Molders' Union and the National Founders' Association were broken off in 1904, members of the latter continued to use molding machines with entirely satisfactory results. Output was increased and thousands of dollars were annually saved to those who persisted in using and experimenting with the various types and combinations of appliances available.<sup>2</sup> Some of the achievements are interesting and suggestive. A report written in the spring of 1905, about a year after a very hard and bitter strike had been initiated in three large heater shops, notes the following: one foundry employing forty men at molding had only five journeymen; another had two journeymen out of twenty-eight; and the third had fifteen out of a molding force of one hundred and ten. All three firms were using molding machines and had contracted for the delivery of more. The operators were Poles and Italians, many of whom could not speak English and

<sup>1</sup> United States Bureau of Labor. Eleventh Special Report of the Commissioner, 1904, "Regulation and Restriction of Output," pp. 149, 150; David A. McCabe, "The Standard Rate in American Trade Unions," p. 110; Proceedings, Conference, Detroit, October, 1902 (MS.), pp. 22, 74.

<sup>2</sup> The Review, October, 1905; Proceedings, N. F. A., November, 1905, in The Review, December, 1905, pp. 44, 46, 47; N. F. A., Plain Talk Pamphlets No. 2, p. 5.

who had never worked at molding before. The day rate was \$1.50 to \$1.75. At piece prices, the method of paying about half the force, from \$2.00 to \$3.00 was paid, with more earning in the neighborhood of \$2.00 than \$3.00. While this was in excess of any pay the men had received before they took up molding, the saving to the manufacturer was considerable.<sup>1</sup> In these same foundries the average cost per ton for furnace molding had been \$20.50 before the strike; a year later it was \$16.25. When all the machines which had been contracted for were installed, it was expected the cost would be reduced to about \$14.00 per ton.<sup>2</sup>

This same report notes operations at a certain pipe foundry. One Pole was putting up sixteen molds per hour, size 16" x 19", from a pattern made for six pieces of one and one-half inch steam pipe fittings, requiring six cores in each mold. The man worked nine hours continuously at molding and netted one hundred and

<sup>1</sup> The following table of rates compares prices paid before machines were introduced, and the machine molding price.

	Former price	Subsequent price
Base ring.....	\$0.36	\$0.25
Base ring.....	.55	.27
No. 36 upper deck .....	.34	.30
No. 40 upper deck .....	.42	.22
No. 44 upper deck .....	.60	.25
No. 36 lower deck .....	.37	.20
No. 40 lower deck .....	.47	.22
No. 44 lower deck .....	.66	.28
No. 36 upper fire-pot .....	.26½	.11
No. 40 upper fire-pot .....	.33½	.11
No. 36 lower fire-pot .....	.24	.11
No. 40 lower fire-pot .....	.29	.11
No. 36 shaking bar grate .....	.08½	.04½
No. 40 shaking bar grate .....	.09½	.04½
No. 40 short grates .....	.08	.04
Feed doors .....	.09½	.04½
Clean out doors .....	.05½	.02½
Clean out cellar .....	.06	.03
Water pan .....	.14½	.07
Water pan frame .....	.05½	.02½

Minutes of the Administrative Council, N. F. A., August 7, 1905 (MS.).

<sup>2</sup> *Ibid.*

fourty-four molds in that time. This represented eight hundred and sixty-four pieces of cored castings weighing eight hundred and seventy-five pounds. He was paid one and one-half cents per mold, or a daily wage of \$2.16. Other men were said to be turning out forty-two pieces of soil pipe, five feet long and four inches inside diameter. The comment was that no living molder could put up over half of these jobs by ordinary molding methods.<sup>1</sup>

In addition to small and purely repetitive work, Association members have come to make heavy and intricate castings on molding machines. The patterns thus mounted may be changed from four to ten times a day.<sup>2</sup> With a proper adjustment of patterns and flasks, almost any mold can be made on some type of machine.<sup>3</sup> Indeed, the only limit seems to be imposed by the size of the machine itself.<sup>4</sup> The commissioner of the Association cites a number of instances of large and complicated molds handled in this way. A gas engine bed with a flask fourteen feet long, six feet wide and four feet deep, weighing with sand, pattern and board nearly 30,000 pounds, was made on a machine by one handyman and one helper in eighteen hours, where the previous method had taken the time of one molder and one helper for five days. The finished casting from this mold weighed 11,920 pounds and had the additional advantage of being 1,000 pounds lighter than it would have been had it been made according to the old method.<sup>5</sup>

<sup>1</sup> Minutes of the Administrative Council, N. F. A., August 7, 1905, (MS.).

<sup>2</sup> Report of the Commissioner, N. F. A., November, 1908, in *The Review*, December, 1908, p. 33.

<sup>3</sup> Report of the Commissioner, N. F. A., November, 1910, in *The Review*, December, 1910, pp. 29, 30.

<sup>4</sup> Report of the Commissioner, N. F. A., November, 1911, in *The Review*, December, 1911, p. 28; *The Review*, January, 1910, p. 33.

<sup>5</sup> *Ibid.*, September, 1909, pp. 11-13; *ibid.*, January, 1910, p. 76.

Further examples might be produced to show the use of molding machines for this and similar work.<sup>1</sup> But it is important to note other items. In some cases no alteration whatever in the pattern is necessary in transferring from hand to machine molding; in others, machines can be used only because of the expert engineering skill that has gone into the making of the patterns.<sup>2</sup> For some castings, such for instance as heavy machinery, part of the molding work may be done on the machines and part by skilled molders on the floor or the bench.<sup>3</sup> Again, machines for molding some specialties have been made absolutely automatic. They require no human labor whatever save for setting the cores, pouring the metal and shaking out the castings.<sup>4</sup>

With adequate machinery, it takes but little time nowadays to transform a common laborer into a first class machine molder. At first, it is probable that a considerable amount of bad work was produced on the machines. For a long time the Union made a great deal of this point, and claimed that the discount for bad work often ran from 30 to 50 per cent.<sup>5</sup> With proper machines and instruction, however, it has been found that in from three to six weeks an employer can safely entrust much to a machine operator, and in a few months nothing a machine can handle is beyond the powers of the operators.<sup>6</sup>

<sup>1</sup> See *The Review*, October, 1909, p. 29; *ibid.*, January, 1910, pp. 29, 30. Many numbers of such papers as *The Foundry*, *The Iron Trade Review*, *The Iron Age*, contain articles describing the achievements of machines and mechanical devices of all sorts.

<sup>2</sup> *The Review*, October, 1909, p. 29; *ibid.*, January, 1910, pp. 71, 79.

<sup>3</sup> *Ibid.*, January, 1910, pp. 44 ff.

<sup>4</sup> See, for example, a description of the continuous process in making radiators, in *The Foundry*, vol. xi (January, 1912), pp. 1-5.

<sup>5</sup> Minutes of the Administrative Council, N. F. A., August 7, 1905 (MS.); *Journal*, 1907, and succeeding years.

<sup>6</sup> Probably the following account is typical.

"... The best trick they have done so far is to jar a 24-inch cylinder. They reduced the molding time on this from seven to four days. You would be surprised to see

The advantages to foundrymen of introducing molding machines may be summarized, then, from their point of view, as freedom from dependence upon skilled labor, and especially from negotiations with the Union which had been characteristic of the trade when the labor of its members was an absolute necessity; more accurate molds and longer lived patterns;<sup>1</sup> lighter castings; an increased output varying from double to forty times the production under the hand system;<sup>2</sup> and a decreased cost of production amounting in some cases to 75 per cent.<sup>3</sup>

More progress was made in introducing efficiency methods and output increasing devices in the five years immediately following the break between the National Founders' Association and the Iron Molders' Union than in the twenty-five years preceding.<sup>4</sup> While a number of circumstances contributed to bring this about, undoubtedly the most important single factor was the prevalence of labor troubles and the activity of the Union.

The strikes of 1903 and 1904, instituted by the Union to resist the changes in wages and conditions which the foundrymen undertook to introduce the moment the industrial situation was favorable, resulted in a number of firms breaking away from collective agreements entirely. This they were enabled to do to some extent through the increased use of machines. But the greatest spur to trying out labor substitutes came in the

green men handling 15-ton wheels and 33-inch beds. This bed plate under the old system, with the Union, was a six day job and under the new system they have just completed nine of them in twenty days. The first one cost them four days, and they cast one every two days thereafter." *The Review*, June, 1909, pp. 19, 20.

<sup>1</sup> *Ibid.*, June, 1910, p. 33.

<sup>2</sup> *Hearings* (MS.), vol. i, pp. 255, 256.

<sup>3</sup> *The Review*, October, 1909, p. 29.

<sup>4</sup> Report of the Commissioner, N. F. A., November, 1909, in *The Review*, December, 1909, pp. 35, 36; *Hearings* (MS.), vol. ii, p. 619.



spring of 1906. During the previous two years the Union had been preparing for a general advance in wages, shorter hours and the like, and in May declared what threatened for a short time to be a general strike to bring this about. In many foundry centers it was impossible to secure molders except at the Union's terms. To meet this situation the Association called a special convention and determined to resist the demands, no matter what the cost. Hence foundrymen who up to this time had been indifferent to the molding machines or had refused to consider them, were forced to have them installed in order to get their orders out. A tremendous incentive was given to inventors also to produce machines which would take care of work hitherto considered to be exclusively the province of skilled men.

A circular sent to members of the Association June 23, 1906, estimated that nearly one thousand machines had been introduced since May first, and pointed out that increasing numbers of foundrymen were coming to realize their earning power when operated by intelligent men. The improvement in technique brought about in that crisis caused the president of the Association several years later to make the assertion that until the 1906 strike, the founding industry was at least fifty years behind the times.<sup>1</sup>

The National Founders' Association has encouraged the introduction and use of machines in every way. Special committees have been appointed to make investigations<sup>2</sup> and it is now the accepted policy of the Association when a member is having difficulties with the Union or complains of a shortage of labor, to study the particular shop in question and map out a plan for

<sup>1</sup> Proceedings, N. F. A., November, 1910, in *The Review*, December, 1910, p. 10.

<sup>2</sup> Minutes of the Administrative Council, N. F. A., November 19, 1908 (MS.). See also N. F. A. Service Bureau Bulletins.

installing machines to take the skilled men's places.<sup>1</sup> Just what effect the war and its needs have had on the utilization of machines, is not subject to statistical measurement at this time. The 1917 convention of the Association devoted an entire session to the subject for the purpose of demonstrating to its members how many current problems might be solved by the introduction of mechanical equipment. Molding machine manufacturers are said to be overwhelmed with orders, and delivery cannot be made in less than six or eight months. It is to a certain extent true that "the molding machine and the handyman molder have made possible the open shop in the foundry."<sup>2</sup>

Specialization has been developed to the highest possible degree. Trained designers make patterns so simple that a man with little experience can use them. Tool makers have cooperated to turn out machines for making castings which the molder of twenty years ago would have said only the most skilled mechanic could produce. Laborers and operatives trained not in the general trade of molding, but only in one simple branch, do work which it was thought belonged to the expert on the bench. Coremaking, which everywhere used to be regarded as a trade in itself, has also become somewhat of a machine process. The technique of cupola and ladle have been vastly improved. An overhead crane reaching into all parts of the shop, lifts patterns and molds and castings. Sand is cut, mixed and sifted, and castings are chipped and cleaned by machinery. In up-to-date foundries a mechanical engineer often has charge of the entire plant; a chemist tests iron and sand for each of the special uses to which they are to be put. Everywhere the development of the industry has meant

<sup>1</sup> Report of the Commissioner, N. F. A., November, 1910, in *The Review*, December, 1910, p. 27.

<sup>2</sup> *Ibid.*, p. 30.

increasing differentiation between the mental and the manual work, more intense simplification of processes, more minute specialization of tasks.<sup>1</sup> With this has come greater efficiency of management, a higher standard of safety, and better conditions generally for workmen, producers and the consuming public.

It is not to be understood that this development of specialization and the use of machines has entirely eliminated the Iron Molders' Union from its very important place in American foundries. That the Union has retained its foothold is due to the tireless watchfulness of the organization's leaders, and their speedy adaptation of union law to meet the changing conditions. At the 1907 convention, additional steps were taken to get the machine operators into the organization. This came the year after their only partially successful general strike had shown how powerful a weapon the molding machines might be against them. The constitutional qualifications for membership were defined so as to include machine operators as such; they were to be granted a special charter in any community large enough to support a separate local,<sup>2</sup> and the officers were given great latitude in determining the method of compensation for work done on the machines.<sup>3</sup>

A definite campaign to organize the machine operators was undertaken forthwith. This plan under way, the Union believed its machine problem had been solved. But new issues continued to arise. Individual

<sup>1</sup> Subdividing foundry work may be carried to such extremes as to produce facing mixers, mold rammers, pattern drawers, gate formers, feedinghead makers, mold closers, metal temperature judges, mold pourers, casting feeders, etc., etc., all knowing but the one thing which has been learned in a few weeks. *Journal*, 1913, p. 41.

<sup>2</sup> *Proceedings*, I. M. U., 1907, pp. 102, 103, 193; Constitution, adopted 1907, Article VIII, Section 6.

<sup>3</sup> *Journal*, 1907, p. 650.

members insisted upon advocating the destruction of machines or handicapping their usefulness as much as possible;<sup>1</sup> proposals were made to do away with the special machine molders' cards, which would allow only men who had been at the trade four years to operate the machines.<sup>2</sup> The executive board has sanctioned a number of grievances of locals against the use of handy-men on machines,<sup>3</sup> but has adhered firmly to the policy of organizing and bringing into the Union as many machine operators as possible.

In the foundries where the apprentice ratio of one to five journeymen prevails, the policy has been to allow machine operators who have served less than four years, only if the apprentice quota is not complete.<sup>4</sup> It is expected that in union shops all molding machines will be operated by union members or apprentices.<sup>5</sup> No member is permitted to teach or instruct a machine operator who does not belong to the Union or who is not an apprentice, under penalty of expulsion. A union foreman cannot work over a non-union machine operator unless the latter is an apprentice.<sup>6</sup>

The net result of the attempts to enforce in American foundries these machine policies of Union and Association, so essentially in conflict, would be hard to estimate. The following table based on figures furnished by the secretary of the National Founders' Association, shows the per cent machine operators were of the total molding force in the foundries of Association members at different periods:<sup>7</sup>

1900 .....	9.4 per cent
1905 .....	14.4 " "
1910 .....	19.4 " "
1913 .....	22.8 " "

<sup>1</sup> Journal, 1909, p. 122.

<sup>2</sup> Proceedings, I. M. U., 1912, pp. 166, 243.

<sup>3</sup> Ibid., p. 51.

<sup>4</sup> Ibid., pp. 126, 127, 206; Constitution, adopted 1912, Article XIII, Section 8.

<sup>5</sup> See also Quarterly Journal of Economics, vol. xxx (February, 1916), p. 381.

<sup>6</sup> Ibid., p. 223.

<sup>7</sup> Ibid., pp. 156, 206, 223, 238.

In the same time, skilled bench and floor molders changed in relative importance to the total molding force as follows, constituting in

1900	.....	75.7 per cent
1905	.....	63.0 " "
1910	.....	54.3 " "
1913	.....	51.8 " "

Comparing these two groups, it appears that while molding machine operators have increased considerably in importance to the total molding force in Association foundries, skilled mechanics have been displaced at a more than proportionate rate. It thus would seem that machine operators alone cannot be charged with having driven journeymen from their accustomed trade. Of nearly as great importance in bringing this about has been the increase in the numbers of unskilled specialty molders. Data available do not permit of distinguishing this class of labor from apprentices in 1900, but the increase even from 1905 to 1913 is significant.

Per cent specialty molders were of the total molding force:

1905	.....	9.5 per cent
1910	.....	15.0 " "
1913	.....	15.6 " "

These figures, taken in connection with the preceding groups must not, however, be used as conclusive evidence that unskilled workmen are usurping the places of journeymen in the foundries of members of the National Founders' Association, because of the fact that there is no way of measuring to how great an extent the class of foundries making up the membership of that body has changed, so as to offer a wider opportunity for the employment of laborers.<sup>1</sup> Nevertheless, from the facts

<sup>1</sup> An increase in the number of members who made specialties as against those who made heavy machinery would mean a greater likelihood of the employment of machine operators and specialty molders. The reverse would be true if the increase in members came from the ranks of the heavy machinery makers.

available it seems likely that while skilled mechanics continue to occupy an important position in Association foundries, their place is gradually being taken by inferior craftsmen.

How this tendency compares with conditions generally cannot be stated. In 1910, the National Founders' Association employed 13.4 per cent of all those in the country who worked at the trade of molding.<sup>1</sup> Eighty-five per cent of its members run open shops.<sup>2</sup> It is therefore possible that among those foundries where union influence has had more weight, skilled journeymen are of relatively greater importance than in the shops of the Association. Certainly up to 1908, the Union had succeeded admirably in controlling the machine situation in the shops of the Stove Founders' National Defense Association,<sup>3</sup> and as these two latter bodies never came to an agreement as to the pricing of work done on the machines until 1914, it is quite likely there has been but little change up to the present time.

The Union itself offers no data as to the relative importance within its membership of skilled mechanics, specialty molders and machine operators. Nor is there any satisfactory means of estimating the probable composition of its membership, at the present time as compared with twenty years ago. It seems very probable, however, on the basis of known facts, that even tho the numbers over a given period are substantially identical, a smaller and smaller proportion are skilled men.

This much is true: molding machines have made serious inroads upon the molders' trade; the employers

<sup>1</sup> On the basis of 18,411 molders and coremakers, exclusive of apprentices, employed by the National Founders' Association, and a total of 137,262 male molders, founders, casters and coremakers enumerated in the census of 1910, Thirteenth Census of the United States, 1910, vol. iv, Table VI.

<sup>2</sup> Hearings (MS.), vol. i, pp. 242-243, 245, 248, 251.

<sup>3</sup> Stove Founders' National Defense Association. Report of the Committee on Machinery, 1908.

of the country have come to realize the value of machines and are using them in ever increasing quantities; the Molders' Union has been obliged to alter its policy at a number of points to allow for the changed conditions. On the other hand, it is not true that machines have made human skill unnecessary for foundry work. There is still a great demand for trained men. Even with specialization and machine molding, experts are required to set cores, finish and close molds, and perform other similar operations demanding the application of technique and judgment. Some types of molding are as yet entirely unadapted to the machines.

To how great an extent the proportion of skilled men required will decrease in succeeding decades cannot possibly be determined. On this will hinge almost entirely the Union's structure and activities. And on this will depend to a large degree the future policy of the Association. If a steadily increasing proportion of the trade is given over to machines and unskilled foreign workmen whom it is difficult for the Union to organize and hold in the face of alluring offers from their employers, the Union is likely to suffer. If the maximum possibilities of the machines have already been realized, the Union stands a very fair chance of holding its own, no matter what the organized employers may do.

MARGARET LOOMIS STECKER.

CAMBRIDGE, MASS.



## SOME ASPECTS OF FRENCH RAILWAY WAR FINANCE

### SUMMARY

Provisions of the agreements of 1883, 309.— Distinction between statutory interest and dividends, 311.— Terms of state's guaranty of earnings, 312.— Results for the Eastern, P. & O., and Southern companies up to 1914, 316.— Results since 1914, 319.— Results for the Northern and P. L. M. companies up to 1914, 321.— Results for the same companies since 1914, 321.— Measures of relief suggested for the Eastern and Northern lines, 324.— Proposal for advance of rates on all roads, 327.

FRENCH railway war finance can be understood only by reference to the railway policy of the French government. This policy, or series of policies, dates back to 1842, when the first government plans for the development of the railway net of France were projected. The plans of 1842 contained features similar to those present in the modern French railway system. Paris was to be the central point to be touched by the most important lines, construction costs were to be shared by the state and the private railway companies, and after a period of years the lines would become the property of the government. A railway panic in 1847 and the political uncertainties of 1848 served to cause the cessation of development, and in order to secure the early formation of a system of lines laws were enacted in 1854, 1857, and 1859, by which there were introduced definitely two policies: that of territorial distribution and monopoly so far as concerned the private companies; and that of governmental guaranty of interest charges on costs of first construction. In 1865, when the lines provided for by these laws were nearing completion, the government, finding bad local gaps in the system, authorized the

building of the needed local lines by private companies subsidized by local governing units; a plan which resulted in the absorption of many of these small lines by the Northern company and in the taking over of those in the southwest by the state.

The Franco-Prussian war served to emphasize the importance of adequate transportation facilities, and in the late seventies France entered upon an extensive project for a system of state railways. It was proposed to build between 1878 and 1888 about 10,000 miles of road and to make in addition very extensive and costly improvements of harbors and internal waterways. But domestic political changes and fiscal difficulties arising from the financial stringency of 1881-82 combined to give the private railway interests an opportunity to come to formal agreement with the state regarding future railway developments. And it is with the conventions or agreements entered into in 1883 by the state and the six big companies — the Northern, the Eastern, the Paris-Lyons-Mediterranean (hereafter referred to as the "P. L. M." company), the Paris and Orléans (hereafter referred to as the "P. and O."), the Western, and the Southern — that we are chiefly concerned in this historical review.

By the oft-cited agreements of 1883<sup>1</sup> the monopoly principle of territorial distribution was accepted and continued. Further, additional railroad construction was agreed upon to the amount of about 5000 miles, the cost of this construction to be shared by the state and the private companies. Third, and most important for the present purpose, the state gave to the private companies its guaranty of the interest, amortization and

<sup>1</sup> For the full texts of these agreements and of the laws ratifying them see Picard, Alfred, *Les chemins de fer français*, vol. vi. For summary presentations see Picard, *Traité de chemins de fer*, vol. ii, pp. 307-316, 410-413; also Kaufmann, Richard, *Eisenbahnpolitik Frankreichs*, vol. i, pp. 352-379.

accessory charges on certain bonds, and of the "interest" and dividend payments and of the amortization charges on the capital stock of the private companies. The bonds whose charges were thus guaranteed were bonds similarly guaranteed by earlier laws, but also, and more particularly, bonds to be issued for the development of the lines projected by the agreements of 1883. Amortization of the bonds was to be in accordance with schedules to be prepared for each road, the bonds to be completely amortized on or about the dates of termination of the charters of the several companies.

More detailed explanation is required concerning the guaranty given by the state in the matter of the "interest" and dividend payments and the amortization charges on the stock of the companies. Owners of French railway stock receive both "interest" and dividends, the former usually referred to in government and railroad reports as "statutory interest" and expressed as so many francs per share. For example, the statutory interest of ordinary shares of stock of the Northern railway is 16 *fr.* per share of 400 *fr.* par value, or 4 per cent. That of ordinary shares of the P. L. M. company is 20 *fr.* per share of 500 *fr.* par value, or 4 per cent. For the Eastern, P. and O., and Southern companies, all of whose shares have a par value of 500 *fr.*, the statutory interest payments are respectively 20 *fr.*, or 4 per cent, 15 *fr.*, or 3 per cent, and 25 *fr.*, or 5 per cent.

The word "dividends" when narrowly interpreted refers to earnings divided among the stockholders over and above, or at least apart from, the interest payments just described. The word may be used more inclusively to mean gross dividends, or both interest and dividends proper, as, for example, in the table customarily presented in the annual reports of the roads entitled "Liquidation du Dividende."

For our immediate purpose the significance of the distinction between interest and dividends proper on stock hinges upon the unique method whereby the stock of the railroads is amortized — this amortization, like that of the bonds, to be completed on or about the times of the expiration of the companies' charters. The method of amortization is as follows. Each year there is a drawing of shares by lot. The holders of the shares so drawn are paid the par value of their holdings. But the repayment of the principal of 400 *fr.* or 500 *fr.* per share does not terminate the investment relationship. The shares drawn and paid off become shares "*de jouissance*," literally, "of privilege." They remain in the market and are bought and sold freely. Thereafter, until the termination of the company's charter, they pay dividends proper, but not interest. Shares not yet drawn, which pay both interest and dividends proper, referred to above as "ordinary" shares, are called shares "*entières*" or "*toutes payées*." To illustrate from the records of the Southern company, since 1884 shares "*toutes payées*" have each year paid 25 *fr.* interest and 25 *fr.* dividends proper, while the shares "*de jouissance*" have paid only 25 *fr.* dividends.

With this explanation of the nature of the returns received by the different classes of stockholders it is possible to revert to the subject of the guaranty of earnings by the state. This was, in effect, that the state guaranteed the interest, amortization and accessory charges on bonds issued, as already described, the amounts necessary from year to year to pay off the shares "*toutes payées*" drawn by lot to become shares "*de jouissance*," and, in addition, certain lump sums of money, of different amounts in the cases of the several roads, to be available for the payment of gross dividends, that is, both interest on stock and dividends proper.

Thus the Northern company was guaranteed 20,000,000 *fr.* for distribution annually among the shareholders, the P. L. M., 44,000,000 *fr.*, the Eastern, 20,750,000 *fr.*, the P. and O., 24,600,000 *fr.*, the Southern, 12,500,000 *fr.*, and the Western, 11,550,000 *fr.* These sums amounted to dividends (gross) of 55 *fr.*, 38 + *fr.*, 35.5 *fr.*, 41 *fr.*, and 50 *fr.* respectively for the first five of these roads as listed above.

All sums advanced by the state under the guaranty provisions of the agreements were to constitute a debt to the state bearing interest at 4 per cent,<sup>1</sup> and dividends in excess of the guaranteed sums given above were not to be declared out of earnings from the operation of guaranteed lines until all debt of this origin should be extinguished.

Fourth, supplementing the guaranty provisions just described arrangements were made in the agreements of 1883 for the sharing by the roads with the government of the results of unusually successful operation. Maximum limits were set to the unrestricted private appropriation of earnings. Let us illustrate from the agreement relating to the P. L. M. company. If this road, in any year, should have net earnings from the operation of guaranteed lines so large that, after having set aside the 44,000,000 *fr.* guaranteed by the state, and after having extinguished all debt contracted in past years under the guaranty, there should be a surplus of earnings not yet appropriated, any such surplus up to 16,000,000 *fr.* might be taken by the shareholders as dividends. But beyond this limit of 16,000,000 *fr.* of surplus earnings (or of 60,000,000 *fr.* of total net earnings) there must be a sharing of profits with the state, two-thirds of the excess sum being taken by the lat-

<sup>1</sup> The Southern company has obtained a reduction of this rate to 3 per cent, owing to its having given over to the state a certain canal.

ter.<sup>1</sup> Similarly, the limits set for the other private lines now operating as such were set in 1883 at the following figures: for the Northern, 38,062,000 *fr.*, for the Eastern, 29,500,000 *fr.*, for the P. and O., 34,200,000 *fr.*, and for the Southern, 15,000,000 *fr.*

Fifth, by the terms of the agreements of 1883 the dates of the termination of the guaranty of earnings were set as follows:<sup>2</sup> for the Northern and the P. L. M., December 31, 1914; for the Eastern, December 31, 1934; for the Western, December 31, 1935; for the P. and O., December 31, 1956; and for the Southern, December 31, 1960.

Sixth, on the expiration of the charters of the several companies (the expiration of the concessions occurring variously from December 31, 1950 in the case of the Northern to December 31, 1960 in the case of the Southern) the roads were to become the property of the French government, the latter compensating the private owners for rolling stock and supplies on hand. To protect itself in this connection, the government has specified that in the last five years preceding the expiration of each company's charter it, that is, the government, may control absolutely all expenditures for the maintenance of rolling stock and supplies. Of course, in the settlement, sums owed the state for advances under the guaranty will be taken into account in favor of the state.

Finally, it was arranged that at any time after 1898 the state might purchase any or all of the systems, the purchase price to be determined upon the basis of the net annual income of the road or roads in question for the seven years preceding the date of purchase. From the sum of the net annual incomes for this period there

<sup>1</sup> In 1897 the P. L. M. company and the government entered into a new agreement whereby the upper limit for the exclusively private appropriation of earnings was lowered to 54,000,000 *fr.*

<sup>2</sup> More accurately, the agreements have been officially interpreted as fixing the dates.

were to be subtracted the net annual incomes of the two most unfavorable years of the seven. The remaining amount was to be divided by five, and the result was to be the amount to be paid annually by the government to the company for the duration of the company's concession. The company was to be reimbursed for all rolling stock and supplies on the basis of the estimates of experts, and, of course, debt of the road to the state contracted under the guaranty provisions would enter into the calculations. It was under the provisions of this part of the agreements of 1883 that the government in 1909 took over the Western system.

The unique relationship established between the roads and the government by the agreements of 1883 has affected the accounting forms and methods of the roads in a way which has an important bearing upon any study of French railways from the standpoint of investment. It is necessary for the roads to distinguish carefully between those parts of their operations which do and those which do not come under the government's guaranty of fixed charges and interest and dividends. As a result the income accounts of the roads are split up into many items which are not at all comparable to the terms and items appearing in the income accounts of American roads. Roughly, it is customary for the companies to present first the net results of the operation of the guaranteed lines, showing clearly just what the state's guaranty is and to what extent it has been found necessary in the current year to take advantage of the guaranty, and then adding other items which are concerned with operations on unguaranteed parts of the system or with outside investments. Finally the disposition of income is shown.

The French railways have separate accounts for real and personal property in which undivided profits are



invested. These accounts are called "*domaine privé*." Revenue from this surplus is free from all liens of the state. The companies can increase dividends from this source without governmental interference, that is, without being under the necessity of using these funds for payments of debt contracted under the guaranty provisions of the agreements of 1883 or of sharing with the government any excess earnings. The government has the right to audit these accounts and controversy is apt to arise as to the propriety of the inclusion of certain items. Obviously it is to the interest of the roads to transfer as many items as possible to these accounts in order to enlarge the amount paid by the government as guaranteed interest and dividends or to decrease the amount of the government's share of excess earnings.

These, then, are the conditions under which the operation of the large railroads has taken place since 1883 and up to the outbreak of the war in 1914. Before passing to the developments since the latter date it is necessary to summarize the actual results of operation in the years before the war. In doing so we may eliminate from further consideration the Western company, now owned by the government.

The other five roads participating in the agreements of 1883 may be divided into two classes: those which have repeatedly and consistently had recourse to the state for financial assistance; and those which have had little such recourse and, at least in recent years, have been, until the war, on a self-supporting basis.

In the first class must be placed three roads, the Eastern, the P. and O., and the Southern. Let us glance at the guaranty histories of these companies, commencing with the Eastern.

Each year from 1883 to 1898 this road received a sum of money from the state, the smallest amount received

in any one year being 2,982,000 *fr.* (in 1898), and the largest being 17,147,000 *fr.* (in 1894). But from 1898 to 1912 in only two years (1901 and 1902) did the company receive payments from the state under this head. In all of the other years before the war the company made payments to the state of either interest or principal of its guaranty debt. On September 6, 1911 the Eastern company entered into an agreement with the government, ratified by law on January 24, 1912, whereby the road was to repay to the state the principal of the debt hitherto contracted under the guaranty provisions of the agreements of 1883. More specifically and immediately, it was to pay to the government in twelve monthly installments 158,720,000 *fr.*, which it was to procure by the issue of bonds bearing interest at 3.75 per cent. Since the debt of the road to the state bore interest at 4 per cent, a saving to the company of interest charges of one-fourth of 1 per cent was thereby effected. The state, on the other hand, would recover any possible loss of interest in the present by the collection of stamp taxes on the new bond issues. The total debt to the state as of December 31, 1911 was about 197,000,000 *fr.* (168,719,000 *fr.* principal and 28,619,000 *fr.* interest). By adding to the proceeds of the bond issues thus authorized surplus earnings in the years 1911, 1912, and 1913, the road in the last named year finally wiped out its debt under the guaranty provisions of 1883. The agreement of 1911 also provided that thereafter the government should share in earnings in excess of 20,750,000 *fr.* rather than in those in excess of 29,500,000 *fr.* That is, the minimum earnings guaranteed became the maximum earnings legally available for exclusively private appropriation in the form of dividends.

As regards its dividend history, the Eastern company from 1883 to 1912 paid its stockholders annually the 20 *fr.* guaranteed statutory interest and the 15.5 *fr.* guaranteed dividends proper. In 1913, however, it completed the wiping out of the old guaranty debt, paid gross dividends of 37.5 *fr.* instead of the traditional 35.5 *fr.*, and in addition paid over to the government 4,699,000 *fr.* under the provisions of the modified agreement relating to the sharing of excess profits. The financial results of the year 1913 were unprecedentedly favorable.

The P. and O., like the Eastern, received in the years from 1883 to 1898 sums of money ranging from 1,997,000 *fr.* to 17,746,000 *fr.* The years 1899-1909 were more prosperous, and the road was able to turn back to the government sums of money in partial payment of the debt incurred under the guaranty. But since and including 1910 until the outbreak of the war operation became less profitable, the operating ratios rising with rising commodity prices and with unusual losses caused by floods. In 1911 the road received 14,613,000 *fr.* from the government, in 1912, 9,213,000 *fr.*, and in 1913, 17,468,000 *fr.* This company possesses some "domaine privé" which yields a fixed income of about 1,800,000 *fr.*, so that dividends proper have usually been declared somewhat in excess of the guaranteed amount (41 *fr.* per share). From 1883 to 1888 dividends proper were declared annually of 42.5 *fr.* per share; from 1889 to 1901 of 43.5 *fr.* per share; and from 1902 to the outbreak of the war of 44 *fr.* Gross dividends were for these periods respectively 57.5 *fr.*, 58.5 *fr.*, and 59 *fr.*

The Southern company received from the government each year between 1883 and 1903 sums ranging from 1,435,000 *fr.* to 18,746,000 *fr.* In 1904, 1905, 1906, 1908, and 1912 the road made payments in partial settle-

ment of the debt thus contracted. In 1907, 1909, 1910, 1911, and 1913 the government advanced sums under the guaranty, the amount so paid in 1913, the last year preceding the war, being only 922,000 *fr.*

Since the agreements of 1883 became effective this road has uniformly paid 50 *fr.* gross dividends, or 25 *fr.* statutory interest and 25 *fr.* dividends proper. In other words, previous to the war it had been able to maintain only such dividend payments as were guaranteed by the state.

Now these three roads, having financial relations with the government such as have just been reviewed, not only fall in the group of roads which have depended fairly consistently upon governmental assistance, but also constitute the group which has been legally privileged to meet the problems of war without change of relationship with the government. The guaranties of interest in the three cases do not expire until 1934, 1956, and 1960. Therefore, when, at the outbreak of the war, the Eastern company found itself deprived of long stretches of track and of some of its rolling stock and equipment, captured by the invaders, it had only to continue operation as best it could, relying upon the government to make good its guaranty of earnings. In 1914, 1915, and 1916 the Eastern company received from the public treasury sums respectively of 62,585,000 *fr.*, 87,731,000 *fr.*, and 49,322,000 *fr.*, and has thus been enabled to maintain its dividends at the traditional level — 35.5 *fr.* "par action toute payée" and 15.5 *fr.* "par action de jouissance."

In the case of the P. and O., there has been no loss of mileage and very inconsiderable, if any, loss of equipment due to the war. Operating difficulties have consisted chiefly of circumstances affecting all the railroads alike, such as rising costs due to rising prices and wages,

particularly rising fuel costs, the interference of military movements with such commercial traffic as has continued under war conditions, and the performance of military transportation operations for the government at rates of compensation determined upon by agreement several years before the war and therefore now entirely inadequate. While in 1911, 1912, and 1913 the P. and O. received from the government under the terms of the guaranty 14,613,000 *fr.*, 9,213,000 *fr.*, and 17,468,000 *fr.* respectively, in 1914, 1915, and 1916 these payments amounted to 51,242,000 *fr.*, 19,868,000 *fr.*, and 24,200,000 *fr.* But there has been no departure from the traditional dividend declaration of 59 *fr.* "par action toute payée" and 44 *fr.* "par action de jouissance."

The Southern road experienced difficulties of operation similar to those described as affecting the P. and O. The guaranteed earnings paid over by the government mounted from 922,000 *fr.* in 1913 to 19,690,000 *fr.* in 1914, 17,407,000 *fr.* in 1915, and 17,603,000 *fr.* in 1916. But as in the cases of the Eastern and P. and O. companies there has been no departure from the traditional dividend policy, the shares "toutes payées" receiving 50 *fr.* interest and dividends proper and the privileged shares 25 *fr.* dividends proper.

We have, then, in the cases of these three roads a situation in which the shareholders are suffering no present curtailment of dividends, these being guaranteed and paid by the government, the government apparently raising no question as to the validity of the contracts or as to the desirability of continuing the present arrangements. It is well to note, however, that the stockholders of these roads are very decidedly choosing present rather than future uses of goods. For by the terms of the agreements of 1883 the sums now being paid by the state to the roads as guaranteed earn-

ings constitute a debt of the roads which will enter into the calculations to be made whenever the government shall take over the roads, whether this occur at the expiration of the companies' concessions or earlier by reason of the state exercising the right of purchase.

The Northern and P. L. M. companies present somewhat different cases. These two companies had, before the war, been the most prosperous of the big French railroads. The Northern had never called upon the government for the payment of guaranteed earnings since the agreements of 1883. Its dividend history had been somewhat more fluctuating than those of the roads already examined; but the dividends had been uniformly satisfactory, the small changes in the rate having always been upward since 1902. In 1912 and 1913 the dividends proper were at the rate of 58 *fr.* per share.

The P. L. M. had not before the war quite as clean a slate as the Northern in the matter of governmental aid. But from 1896 to the outbreak of the war this road made no claim for guaranteed sums, altho in 1901 and 1902 operating deficits were financed by loans from the public, interest and amortization charges on which were guaranteed by the state. In 1898, 1906, and 1907 the P. L. M. turned over to the public treasury, under the distribution of excess profits provisions of the agreements of 1883, sums amounting respectively to 149,000 *fr.*, 9,620,000 *fr.*, and 886,000 *fr.* The guaranteed interest and dividends on stock amounted to 55 *fr.* per share (statutory interest being 20 *fr.* per share), and from 1883 to 1913 the gross dividends fluctuated between the guaranteed minimum of 55 *fr.* and a maximum of 58 *fr.*

The outbreak of the war in August, 1914, found the Northern and P. L. M. companies facing the fact that

on December 31 of the same year their guaranties of earnings would expire. The Northern company, like the Eastern, suffered severely by the loss of mileage and equipment captured by the enemy. Both the Northern and the P. L. M. have since suffered by reason of the difficult operating conditions described in the discussion of the P. and O. situation. To assist these roads the national legislative body on December 26, 1914, just five days preceding the expiration of the old guaranty provisions, passed a general financial law of which Chapter II, Article 20, translated, reads as follows.<sup>1</sup>

In case, after the deductions from the single operating account for the Northern and Paris-Lyons-Mediterranean railway companies authorized by the agreements in force, especially by Article 11 of the agreement of June 5, 1883 for the Northern company and by Article 11 of the agreement of May 26, 1883 for the Paris-Lyons-Mediterranean company, there shall remain an insufficient sum (with the guaranty of interest liquidated in accordance with the said agreements in that which concerns the year 1914) to cover all the effective charges of these systems, these companies shall have the opportunity of carrying all or part of this deficit to their first construction account for the operating period 1914, and for those periods following, up to and including the period which shall follow that in the course of which peace shall have been concluded.

In other words, as a substitute for the old guaranty of earnings these roads are given the privilege for a limited time of capitalizing operating deficits. The companies may issue bonds to make up the amounts of such deficits. That part of the law the translation of which has been placed in parentheses refers to interest and amortization charges on bonds issued in financing the construction of a few separately treated lines (the "new" net of the agreements of 1883).

What, then, has been the financial history of the Northern company since the outbreak of the war? At

<sup>1</sup> Government of France, Bulletin des lois, 1914. Partie principale, section I, bulletin 144, pp. 3240-3255.



the end of 1914 its net operating revenues were 57,665,000 *fr.* as compared with guaranteed fixed charges and revenue for shareholders (as computed under the old agreements) of 127,376,000 *fr.* Of these charges 12,222,000 *fr.* were included under the terms of that part of the new law which in the translation above has been placed in parentheses, and this sum was paid by the state to the road. This left a deficit of 57,488,000 *fr.* for the company to capitalize, i. e., cover by the issue of bonds. For 1915 the amount so raised for dividend purposes was 106,609,000 *fr.*, while in 1916 it was 96,776,000 *fr.* By this process of deficit capitalization gross dividends have been paid each year of 44 *fr.* per share (or dividends proper of 28 *fr.*), a reduction of 14 *fr.* from the dividend rate of 1913.

As regards the P. L. M. company, this road found itself at the end of the year 1914 with a net operating revenue from formerly guaranteed lines of 189,337,000 *fr.*, with fixed charges previously guaranteed by the state of 173,891,000 *fr.*, leaving a net operating revenue from these lines of 15,446,000 *fr.* It had in addition to meet obligations amounting to 32,437,000 *fr.*, obligations, however, falling under the terms of that part of the law of December 26, 1914 which has been translated in parentheses, and cared for by the payment of this sum by the state. Then the company sold bonds to the amount of 14,554,000 *fr.*, thus collecting a sum of money which, when added to the net operating revenue named above and to the road's income from private domain, was sufficient to make certain necessary payments to pension and other special funds and to pay gross dividends of 40 *fr.* per share, or 20 *fr.* dividends proper and 20 *fr.* statutory interest. This cutting down of the gross dividend rate from 57 *fr.* in 1913 to 40 *fr.* in 1914 is spoken of in the reports of the company as an act of

patriotic sacrifice. In 1915 it was necessary for the road to sell only 379,000 *fr.* worth of bonds in order to repeat the gross dividend declaration of 40 *fr.* per share. In 1916, 8,896,000 *fr.* worth of bonds were sold for the same purpose and with the same declaration of dividends.

The situation, then, with these two, formerly the most prosperous of the large French railroads, is that the means have been provided for giving reasonable assurance to the stockholders of the payment of present dividends. But there is not as great certainty of the dividends as in the cases of the Eastern, P. and O., and Southern companies, since dividend paying ability in the case of the two roads just examined is largely dependent upon the marketability of bonds issued to cover operating deficits.

It has been indicated that the shareholders of the Eastern, P. and O., and Southern companies, by their utilization during the war of the guaranty provisions of the agreements of 1883, are choosing the present in preference to a possible future. It appears that the Northern and P. L. M. companies are doing likewise. A consideration that should be carefully weighed before arriving at any judgment as to their wisdom in using to the full the legal means of present relief, concerns the future policy of the French government in railway matters.

There appears to be some opinion in railway and financial circles that it is not improbable that the government will extend even greater means of relief to the Eastern and Northern roads, on the ground that the unusually heavy war losses of these lines are largely due to the seizure of roadbed and equipment by the enemy. The following quotations from the annual reports of the Eastern company may serve to present the reasoning

upon which the hope for additional relief is based. The first quotation is from the annual report of the Eastern company for the year 1914.<sup>1</sup>

While, by our agreement of September 6, 1911, we were freed completely from our debt contracted under the guaranty, and, for the first time since the granting of our concession, the operating period 1913 was completed by a sharing of profits with the state of more than seven millions, the results of the operating period 1914, on the contrary, influenced by the first five months of war, have obliged us to reopen the guaranty-of-interest account by an initial appeal for more than sixty-two and a half millions.

Is this debt definitive? We do not wish to believe so, for we have confidence in the justice of the public authorities. We do not doubt that sometime, when peace has been concluded on the glorious terms for which we all hope, they will take account of the coöperation which the Eastern company has given in the great work of the national defence and will accord to it a just compensation for the heavy losses which it shall have undergone. The decrease of our receipts imposes upon us, in effect, as we have told you, an appeal to the guaranty of nearly sixty-three millions for the last operating period, while, for the whole of the operating periods 1870 and 1871, this recourse did not exceed 32,158,000 *fr.* It results from the comparison of these totals that the two situations are not at all comparable.

And, again, quoting from the report of the same company for the year 1915:<sup>2</sup>

Adding to the sum of 87,731,000 *fr.* the sum of 62,585,000 *fr.*, the amount of our appeal to the guaranty for the operating period 1914, and the 3,426,000 *fr.* of postponed interest payment, one sees that the first seventeen months of war have charged our company with a total debt of 153,742,000 *fr.*, nearly as large as that from which the agreement of September 6, 1911 had freed us, and which was 158,720,000 *fr.*

This new debt has, in large part, for its cause the application of the agreement made by the companies with the state nearly twenty years ago with reference to the rates for military transportation in case of war. At the time when this was negotiated, it was agreed on the advice of the most authoritative military and financial experts, that hostilities would be of short duration, and that, as a result, the troubles which they would bring upon the economic life of the

<sup>1</sup> *L'économiste français*, May 22, 1915, p. 682.

<sup>2</sup> *Ibid.*, May 20, 1916, pp. 723-724.

country would not be slow in disappearing. The facts have given a complete negation to these hypotheses, which appeared nevertheless entirely plausible. It results from this that the reality of things is very far from corresponding to the prophecies and that the terms of the agreement are not in accordance with the conditions of operation which a war whose duration had not been imagined has imposed upon the railroads.

Similar quotations could also be made from sources representing the opinions of officials of the Northern company. As to the probability of such special relief, note the opinion of M. Édouard Payen, expressed in a signed article in *L'économiste français*.<sup>1</sup>

As for the Northern and Eastern companies, as events have continued to show, there is nothing alarming as to their future. The state will surely completely indemnify these two companies for the sacrifices which they have undergone and for the eminent services which they have rendered in the national defence. On the other hand, when peace has been reestablished, these two systems will have new elements of prosperity whose operation will not be slow in making itself felt.

From the legal point of view it is important to note that before the passage of the legislation of December 26, 1914 it was "formally agreed by the representatives of the state and the companies that the authorization given [in that piece of legislation] should not prejudice any question which might arise after the war between the state and the companies, and should maintain intact their respective positions in the matter of later regulations."<sup>2</sup>

While it is true that the Northern and Eastern companies have suffered in the war much more severely than have the other three large private roads of France, it is also true that the other three roads have suffered considerably from the same general causes. There would seem to be little ground for considering the exist-

<sup>1</sup> *L'économiste français*, June 17, 1916, p. 830.

<sup>2</sup> *Le journal des transports*, July 17, 1917, p. 123.

ing differences of extent of suffering as also being differences of kind; especially since to make such a distinction would be to ignore the present grouping of the roads on the joint basis of their guaranty histories and of their present legal relations with the state. That is, it would seem to be illogical for the government to extend special aid to the Eastern company and not to the P. and O. and Southern companies; to the Northern, and not to the P. L. M. The costs of any governmental aid in addition to existing guaranty provisions and other privileges must be borne directly or indirectly by the French nation as a whole, and it would seem reasonable to extend aid, if it is extended at all, on some one principle capable of application to all the companies. There has already been proposed and brought under serious consideration a plan which is in accord with the principle just stated and which does not necessitate any radical modification of existing agreements.

This plan, which has been tentatively agreed upon by the roads and the proper administrative officials of the French government, and at the present writing is awaiting the ratification of the legislative branch of government, includes a 15 per cent increase of traffic rates together with an elaborate scheme for the pooling and distribution of the increased earnings anticipated therefrom and for the ultimate but gradual return to the schedules of rates now in force. The proposal is somewhat as follows.<sup>1</sup>

During the continuance of hostilities and during the year which shall follow that in the course of which the cessation of hostilities shall be announced, there will be made a pool of the sums received from the 15 per cent advance of rates, and the sums in this pool shall be

<sup>1</sup> Much of the following description is a rather free translation of parts of a descriptive article in *L'économiste français* (June 9, 1917, p. 780).

divided among the roads participating in the plan on the basis of a comparison of operating ratios for each year with the operating ratios of the year 1913. Then, upon the expiration of the first year after the war each company shall keep the proceeds of the increase of rates for itself. But when these proceeds shall, for any one system, have become equal to the operating deficit of that system and are sufficiently great to reimburse completely its debt to the state, the company in question shall not keep more than three-tenths of the proceeds of the increase of rates. The other seventh-tenths shall be divided among the other companies in proportion to their receipts.

The increase of rates shall be reduced from 15 per cent to 10 per cent, on all the railway systems when for three consecutive years two railways shall have had excess sums to turn over to the other companies. The rates shall be reduced to the level of a 5 per cent increase over the present rates when, after that, two systems shall have had excess sums to turn over to the other roads for two consecutive years. Rates shall return to their present level when the same effect shall have been brought about again for two consecutive years.

The plan includes concessions on the part of the roads, which concern the right of the latter to shift taxes on fast freight traffic, and concern also the right of the state to share in excess profits, if such excess profits ever again emerge. This latter concession consists of removing the upper limit of the exclusively private appropriation of earnings, thus causing the sharing of earnings with the state to begin when the amount of the guaranteed minimum of earnings is exceeded. This concession is the one already made by the Eastern company in its agreement with the state in 1911.

The Northern railroad, which has been affected most adversely by the war, has expressed a desire not to participate in this elaborate scheme. The proposal is being urged, however, that this company be allowed to increase its rates 15 per cent and keep all the added receipts for itself. Apparently this scheme is satisfactory to the other French roads.

If this plan for increasing rates, or one similar to it, is adopted, the net results will be the partial relief of the government from the obligation of advancing large sums of money annually to the three roads still working under the guaranties of 1883, the partial relief of the shareholders of these roads from the necessity of incurring a debt to the state in order to pay dividends, and the partial relief of the Northern and P. L. M. companies from the necessity of making large issues of bonds each year to cover operating deficits and pay dividends.

As the present article goes to press there has come to hand a copy of the report of the committee of the French Chamber of Deputies which has had the duty of examining the proposed plan for advancing rates.<sup>1</sup> This document is of interest in the present connection chiefly because it presents and criticizes the proposals which have been considered as possible substitutes for the increase of commercial transportation rates.

The committee rejects with relatively little discussion the proposal that a policy of inaction be followed until the termination of hostilities shall make it possible to adopt some scheme designed to meet peace as well as war conditions. Positive relief measures of some kind are considered to be essential to the best interests of

<sup>1</sup> Rapport fait au nom de la commission des travaux publics, des chemins de fer et des voies de communication, chargée d'examiner le projet de loi ayant pour objet d'autoriser le relèvement temporaire des tarifs sur les réseaux de chemins de fer d'intérêt général. No. 3579, Chambre des Députés, onzième législature, session de 1917.



both the roads and the government. Moreover, the charge is made that the advocates of a *laissez faire* policy are those who have long been opposed to the present organization of French railways, and that these individuals are seeking now to make the plight of the companies so extreme that after the war the continuation of the system of private ownership and public control, with guaranteed interest and dividend privileges, will be impossible.

Likewise the committee rejects as impossible in war time the suggestion of state purchase of the private companies. And this plan is deemed inadvisable, even if it were not impossible, in view of the fact that the state's own railway net in 1916 showed the most unfavorable operating results of all the big French railways, having an operating ratio of 100.5 per cent. For reasons connected with the conditions thus indicated the committee rejects as not feasible the suggestion that the state net be turned over to the private companies.

The first method of positive relief to which the committee gives serious attention is that of the imposition of taxes on transportation, the sums thus collected being used by the government for the relief of the railroads. The objection to this plan is as follows. By the terms of the agreements of 1883, if certain taxes then resting upon fast freight traffic should ever be reduced, the railways must make reductions in passenger rates, having the privilege of restoring these rates if the state should ever restore the taxes on fast freight. In 1892 the taxes referred to were reduced and the corresponding reduction of passenger rates was made. The committee reasons that the condition of the national finances at the end of the present war is unlikely to be such as to warrant the early reduction of the transportation taxes, if they are once imposed, and that thereby a

burden would probably be imposed upon the traveling public for several years longer than would otherwise be necessary.

The remaining substitute proposal for positive assistance to the railways is that for the revision of the so-called Cotellet treaty. This is the agreement made by President Cotellet with the roads in 1898 fixing the terms of remuneration for military transportation in time of war. The committee points out that the present railway deficits are not caused solely by the inadequate compensation for military transportation; that rates of compensation for military services should be no higher than is necessary to cover the costs actually incurred in performing such services; and that the raising of the rates now in force would affect the several roads only in proportion to the amounts of military traffic being handled, not necessarily in proportion to their financial needs. As concerns the credit of the railway companies, the plan of modifying the arrangements relating to military transportation could not help materially in the floating of loans for the purpose of renewing old equipment and purchasing new equipment in the years of national reconstruction after the war. As concerns the public treasury, not only would an advance of military transportation rates sufficiently great to meet the needs of the roads violate the principles enumerated above, but the state in making this advance would find itself called upon to make much enlarged direct payments to the Northern and P. L. M. companies, which are now financing their deficits by means of public borrowing.

*Bibliographical statement.* The detailed information relating to the guaranty and dividend histories of the several companies has been largely taken from the annual reports of the roads, especially the information relating to the years immediately preceding and since the outbreak of the war. The reports of the Eastern company have been found in full in *L'économiste français*. In the case of the North-

ern company, access has not been had to the full text of the road's annual reports for the years since and including 1914; but the detailed information needed has been found in summary reports by M. Georges Allix in *Le journal des transports* (July 17, 1915, pp. 121-123; May 27, 1916, pp. 121-124; June 16, 1917, pp. 129-131). For more elaborate details of the operation of the guaranty provisions of 1883 the reader is referred to the annual volume published by the French Minister of Public Works entitled *Statistique des chemins de fer français*. For news items and discussions relating to the proposal for a 15 per cent increase of rates, see *L'économiste européen*, June 22, 1917, pp. 388-389; and *L'économiste français*, June 9, 1917, p. 780, September 15, 1917, pp. 331-334.

STANLEY E. HOWARD.

DARTMOUTH COLLEGE.

## LABOR PROBLEMS IN THE UNITED STATES DURING THE WAR

### SUMMARY

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### I. SPONTANEOUS EVOLUTION OF A GOVERNMENT LABOR POLICY

In the preceding number of the Journal, an account was given of the labor adjustment machinery which had been called into existence and had begun to operate for dealing with labor disputes incident to production for war. It will be the object of this paper now to follow the work of these several boards since September, 1917, the date to which the account was carried in the earlier

article, to record the establishment of additional machinery of a similar nature, and to point out such distinct tendencies as seem apparent from an analysis of these developments. It will be a record rather than a critique of government policy.

In general, it may be stated, that the government, plunged suddenly into a production program of unparalleled proportions, calling for an amount of skilled labor far beyond the available supply, and calling further for multitudinous shiftings of workmen geographically as well as vocationally, has up to this time allowed the economic and social adaptations to come in the main spontaneously, and has acted only where, in the absence of such adaptation, acute industrial disturbances have developed. During the first eight months of participation in the war the government has allowed free interplay to the supply of and demand for labor. This free interplay, in a medium of rapidly rising prices, has brought about a sharp and unprecedented increase in wage scales, which in turn has attracted new labor with some strength into the expanding fields of government production. In other words, under the government's early labor policy in the war, spontaneous adaptation has thus far been allowed in the main to take the place of any strong, centralized controls directed toward preventing maladjustments and acute disputes, such as Great Britain adopted in 1915. Cure rather than prevention has underlain most of the definite developments so far evolved by the government, outside of the Arbitration and Conciliation Division of the Department of Labor, and the United States Board of Mediation and Conciliation in railroad transportation labor. Both of these last-named agencies had been established for years prior to America's entrance into the war, and have rendered important ser-

vice during war time. But during the closing months of 1917, as will presently be shown, there came to be established in different departments, administrative mechanism for the creation of sound labor conditions incident to production for the government, which under proper coördination can go far toward preventing sharp industrial conflicts.

The new devices (those outside the Department of Labor and the United States Board of Mediation and Conciliation) have, in the main, justified themselves. The board for adjustment of disputes in cantonment and other emergency building construction, established under the first arrangement ever entered into between the government and organized labor, finished its principal work with the practical completion of cantonments, and at the present writing finds itself with relatively little to do. The adjustment of disputes in shipbuilding and in the handling of traffic at the ports is carried on by the boards created for that purpose and described in the preceding number of the Journal; their work will be discussed in some further detail here in the following pages. One additional board of a similar nature, created by agreement between the government and organized labor, has come into full existence since September. All of these adjustment devices had their origin in special necessity in some field of production in which one department or another was principally interested. The appointment by the President of the Wilson Mediation Commission, presently to be described, is of a somewhat different character. It may be said to be the first concrete result, during the war, of an attitude toward the labor problem on the part of the President himself.

## II. BRITISH PRECEDENTS

In Great Britain the war was already eleven months old when on July 2, 1915, the Munitions of War Act established a centralized labor policy, following up a number of diverse and disconnected grappings with the labor problem. For convenience of comparison, and even at the risk of repeating familiar matter, the labor policy of Great Britain may be summarily described.

Under penalty against the individual workman, the munitions act forbade strikes in all munitions establishments without prior reference of the dispute to the Board of Trade (which has since been supplanted as to this function by the Minister of Labor). The Minister of Munitions might fix upon any munitions plant the status of a "controlled establishment." In these the principal controls were as follows. (1) Strikes were entirely prohibited. (2) Net profits were limited and excesses over the scheduled limit were to be paid into the Exchequer. (3) Wages, salary and other emoluments could not be increased without referring the proposal for such increase to the Minister of Munitions, whose disapproval would be final unless reversed on appeal by the Board of Trade. (4) Any rule, practice, or custom, not having the force of law, which tended to restrict production or employment was suspended in the establishment for the period of the war (the opening wedge for a general program for the dilution of labor, which has since been prosecuted by the government). (5) A workman in the employ of such establishment might not stop work and then obtain employment elsewhere unless he could produce a certificate from such controlled establishment that he had stopped work with its consent; without such "leaving certificate" his em-



ployment by any other concern was forbidden, except in cases specially provided for, within six weeks of his leaving the controlled establishment, or within such longer period as might be ordered by the Minister of Munitions. The "leaving certificate" was later modified and in 1917 was abolished.<sup>1</sup> (6) Penalties were provided, and munitions tribunals were established to deal with offenses and matters under the act.

The Munitions of War act also provided for the establishment of war munitions volunteers through a special agreement with the Minister of Munitions, by whom a volunteer might be compulsorily assigned at any time to such controlled establishment as might need his labor. The system for recalling skilled workers from the colors and assigning them in uniform to munitions work was also put into operation late in 1915. The Minister of Munitions early stimulated the establishment of training courses for munitions workers in technical schools, and actively encouraged the employment of women in munitions production by issuing, under the power given him by the Munitions of War Amendment act of 1916, orders with reference to standards of wages, hours, and conditions for labor by female workers. More recently the flow of labor to war-time production and its relation to war production have been further controlled in Great Britain by government limitations under the Defense of the Realm act on new employment in classified non-essential industries, and also by restricting the acquisition by non-essential industries of raw materials for manufacture.

Direct machinery in Great Britain for prevention and adjustment of labor disputes under the Munitions of War act as amended, and under other legislation, is

<sup>1</sup> Monthly Review of the Bureau of Labor Statistics, U. S. Dept. of Labor, December, 1917, p. 57.

briefly as follows. The Ministry of Munitions, which, in relation to disputes concerns itself primarily with prevention as distinguished from cure, maintains a numerous staff of Investigation Officers, whose duty it is to watch for incipient disputes and to remove the causes through mediation before trouble can become acute.<sup>1</sup> An active dispute is referred, in the first instance, to the Committee on Production, a body of six members, made up of two representatives from the employer and employee groups respectively, and two from the public, all appointed by the Prime Minister. The matter can then be referred to a single arbitrator, selected either by the parties, or, if they fail to agree, by the Minister of Labour. This Ministry is concerned solely with cure as distinguished from prevention, beginning where the Labour Regulation Department of the Munitions Ministry leaves off. If developments require it, the dispute is then carried to a special Arbitration Tribunal, composed of an equal number of representatives of employers and of employees, and of a Chairman appointed by the Minister of Labour. Altho there has continued to be industrial unrest among the workers of Great Britain, and altho the machinery for dealing with the labor problem has often failed to operate, and has sometimes broken down in operation, the British labor policy as a whole has beyond doubt been of incalculable assistance in producing war necessities. From the developments on this side of the water in industrial relations during war time, now to be discussed, it will be seen that the underlying principles of the British labor policy, or such functional equivalents of those principles as would fit into American conditions, must be established in this country if the war continues for any considerable period.

<sup>1</sup> Manuscript memorandum of June 18, 1917, from the Intelligence and Record Section of the Ministry of Munitions.

### III. THE SHIPBUILDING LABOR ADJUSTMENT BOARD

In the months of October and November, 1917, the work of the Shipbuilding Labor Adjustment Board, for the first time since its creation in late August, 1917, took definite shape through its establishment of wages and conditions on the Pacific coast.<sup>1</sup> Early in October the shipyard workers of Seattle and of Portland were out on strike; while in San Francisco the men were at work following a few days' strike in September, under a tentative agreement which was to remain in force pending the Board's consideration of the dispute, or until November 12.

In Seattle, where the shipbuilders, generally speaking, operate under union conditions, the dispute centered on the wage scale, so that the principal feature of the board's hearings there consisted in investigations of costs of living. The board announced that it would postpone its decision until the completion of its investigations at Portland and San Francisco. The men did not return to work altho the request to do so was pointedly made. The local union of the Brotherhood of Boilermakers, Iron Shipbuilders and Helpers, numbering about 7,000 out of the 12,000 or more men involved, stood out against the other unions which favored a return to work pending the board's consideration of the case. This attitude of the local union being contrary to the intention of the agreement of August 20, 1917, under which the board was proceeding, the international president of the boilermakers' union, accompanied by the international presidents of the machinists' and patternmakers' unions, and by an international vice-president of the sheet metal workers'

<sup>1</sup> Cf. this Journal, November, 1917, p. 137.

union, appeared in Seattle, and these officials addressed themselves to the task of influencing the local boiler-makers, iron shipbuilders and helpers to return to work. Thus was presented sharply at conferences and at open meetings of labor men the crucial question as to whether or not the local unions would conform to the agreement entered into with the government by their national leaders. By a small majority of recorded votes the local union of boilermakers finally favored resumption of work and there was thus averted a serious feud within that union, as well as an initial and damaging blow to the prestige of the Adjustment Board.

At Portland the situation was more complicated than at Seattle. Here the board performed an important constructive service; and here also the national labor leaders played an important part. The strike had been in progress upwards of a month. The wage issue the present was incidental. The union shop was the chief aim of the strike, an aim intensified undoubtedly by a distinctly hostile attitude toward union labor on the part of some of the employers in the maintenance of a fixed "open shop" policy. The memorandum of August 20, for the settlement of shipyard disputes, contained the following provision: "As basic standards with reference to each plant in which such construction is being carried on, the board shall use such scales of wages and hours as were in force in such plant on July 15, 1917, and such conditions as obtained on said date in such plant." In the course of the conferences, the union officials dropped their contention for the union shop upon the ground that the contention was contrary to this provision of the memorandum, since every Portland plant had been "open" on July 15.

The five day hearing at Portland was concluded by the concurrence of the employers and the union officials

in a written proposal addressed to them by the board.<sup>1</sup> The following essential conditions were agreed to: that concessions by either side were to continue as binding only during the period of the war; eight hours was to constitute the working day, with such rates for overtime as should be established by the board; a shop committee system was established, the employees to select their representatives by majority vote; grievances to be taken up by the committee of such representatives, first with the foreman, then with the superintendent, and lastly with the president; in the event of a failure to reach an adjustment through such course, the committee might then call in, for conference with the president, any representative whom it might select. Thus was opened up a way in which union business agents or other union representatives could negotiate directly with employers in the event that any shipyard should employ a majority of union men in its force. No discrimination was to be practised in the reemployment of men who had been engaged in the strike. All questions concerning the employment of apprentices was to be handled through the shop committee system. It is significant that simultaneously, and without any knowledge of the Portland memorandum, another shop committee arrangement, presently to be described (see page 369) was being confirmed in the Arizona copper district by the President's Mediation Commission.

At San Francisco about 25,000 shipyard workers were involved, also necessarily the 20,000 or more workers in city shops. The shipyard plants at San Francisco being all union shops, questions of wage and working conditions were paramount. Most of the condition

<sup>1</sup> The text of the agreement embodied in this proposal, and accepted by both sides, is printed below, p. 384.

questions were long-standing, and probably would lend themselves to adjustment only through elaborate study and investigation into the circumstances at each yard. The board left most of these questions for solution by its examiner for the San Francisco district, selected by joint action of employers and employees in accordance with the memorandum of August 20, 1917.

At the conclusion of its hearings at San Francisco on November 4, the board announced its decision upon a uniform wage scale for shipyard workers on the entire Pacific coast, both in steel and wooden shipyards. From the outset it was doubtful whether the local unions would accept and abide by the decision. The board's method of arriving at its determination of the new wage scale was recounted by it in the following paragraph:

In order to preserve the standards of living in existence before the war we took as a basis the rates on which employers and employees had united as shown by the agreements in effect June 1, 1916. To determine the increase in the cost of living from that time until October 1, we made use not only of the evidence presented at our hearings in the three cities but also of all other available material and investigations including Federal, State and Municipal reports. The wages fixed represent the wages current in the three cities, increased to conform to the ascertained increase in the cost of living.

Applying this method the board found that the cost of living had increased 31 per cent from June 1, 1916 to October 1, 1917; and adding this margin to the minimum scales for skilled workers in effect in Seattle, reached the minimum scale now adjudged by it to be proper. The overshadowing reason why the workers were dissatisfied with the award was that one of the steel shipyards in Seattle, and certain city shops there, on August 1, 1917 had consented to and had put into force a new set of minimum scales under a union agreement which, for machinists, for instance, named \$5.50

for an eight hour day as the minimum until January 1, 1918, after which date it was to be \$6.00. The machinist's minimum wage established by the board was to be \$5.25, to stand until August 1, 1918 or, in the event of a special reopening of the case until May 4, a difference of seventy-five cents a day. Pressure from the coast unions, growing out of this decision, resulted in important changes both in the wages which had been established by the board, and in the status of the board itself. On December 8, 1917, a supplementary agreement was entered into at Washington, between representatives of the Navy Department and the Emergency Fleet Corporation on the one hand, and on the other hand certain of the international presidents who had signed in August the constituent memorandum of the Shipbuilding Labor Adjustment Board. By this supplementary agreement, which recited that it supplanted the previous memorandum, the board was relegated to the status of an intermediate tribunal, the decisions of which were no longer to be final and binding, and could be appealed from to a Board of Review of six members, three representing the government and three representing organized labor. Some of the principal parties to this new charter for adjustment then entered into a separate memorandum agreeing that the decision of the Adjustment Board was to remain in effect only until February 1, instead of until May 4, 1918; that on and after December 15, 1917, a "war service premium of 10 per cent" per week, based upon the minimum rate for eight hours straight time, would be paid to each worker in Pacific coast shipyards who should work forty-eight hours in any six consecutive days, which premium should, after February 1, 1918, be converted into a permanent increase of 10 per cent of the board's rates. This supplemental agreement brought the ma-



chinists minimum per diem compensation, based on an eight hour day, to \$5.775.

Lately, the Adjustment Board has settled some minor questions at long range, through the action of the local examiners on the Pacific coast. A pronouncement of interest is its decision of December 21, 1917, laying down the conditions with reference to length of service which should determine when a house carpenter working at shipbuilding in Columbia River shipyards shall receive the prevailing rate prescribed by the board for shipwrights.

Future adjustments by the Shipbuilding Labor Adjustment Board will take place, it must be remembered, under unusual conditions. There is the possibility of action by the newly established Board of Review, as a court of appeal, this board being equally balanced in personnel between representatives of labor and representatives of the government. It will be of interest to observe what prove to be the results of this form of organization.

#### IV. THE INDUSTRIAL SERVICE DEPARTMENT IN SHIPBUILDING

In the meantime labor problems in shipbuilding are receiving affirmative treatment from another quarter. The Industrial Service Department of the Fleet Corporation is concerning itself with three branches of activity — expedited training of skilled workers, exemption of shipyard workers from military service, and improvement of employment management in shipyards. No similar plan for training shipyard workers seems ever to have been followed in Great Britain. At a large shipyard at Newport News, Va., the Fleet Corporation's Industrial Service Department is conducting a training school for teachers of the shipbuilding trades

in which an intensive six weeks' course is given to picked mechanics sent from the various shipyards. Seventy-two men were graduated from the first session and have gone back to their respective yards to establish a teaching staff and to organize expedited training of new mechanics. In the present class over one hundred and thirty men are in attendance from all over the country, some even from Puget Sound. The Fleet Corporation pays the expenses and time while at Newport News of these normal pupils who are under special contract to remain with their employers as teaching mechanics for at least six months following the period of training. In order to insure the popularity of the training course in the shipyards, the Fleet Corporation has provided that a bonus of fifty cents a day will be paid during the training period to those receiving training. This plan of expedited training does not contemplate the sudden evolution of a helper into a full-fledged mechanic, but is intended particularly to adapt quickly to shipbuilding, mechanics from such wood and metal trades as are cognate to the shipbuilding crafts. For this reason the training plan if pursued judiciously may not encounter serious opposition anywhere. Organized labor seems, up to this writing, not to have indicated any opposition to it. Its potentialities are large for producing out of workers in non-essential trades a rapid increase of skilled shipbuilders.

The Industrial Service Department has a branch devoted to improvement in employment management at shipyards. Unstable conditions in a new and expanding industry, and the continual outbidding among employers competing for the labor supply, have produced in the past six months a most wasteful passing of labor through the great war industries. The Industrial Service Department found that a plant employing an

average of twelve men a year for every position, or in other words, having a "turnover" of 1200 per cent, was by no means a rarity. The art of employment management has grown up recently, based largely upon the policy of finding for each man, gradually, if necessary, the place in the plant where his capacities and his personality will best fit, and of eliminating from his shop life and from his living conditions, so far as possible, influences which pull him down and make him discontented and hostile. It is a problem in selling the job to the man every day; a problem in emotional complexes, in regularization, in production. The Industrial Service Department, by conferences, by placing experienced men in employment managerships, and by correspondence with the shipyards has undertaken to improve conditions of employment management, with a resulting reduction in "turnover" which in some plants has been marked.

These two affirmative methods of handling the war-labor problem, developed in the shipbuilding work, and also, as will be seen later, in ordnance production, have not been borrowed from Great Britain; they are distinctly American. Employment management problems are treated under the British Ministry of Munitions by the Investigation Officers, as incidents to field investigations of trouble; but even in the controlled establishments the government has worked out no such psychological prophylaxis of working conditions in each plant as is being projected here. The Welfare Section of the Ministry of Munitions, by bringing about the employment of women welfare supervisors in controlled establishments, does influence directly the standards for women workers. But the American campaign for improving employment management is not a "welfare" movement; it is the application of a scientific

remedy to a production problem and it extends to all workers. From the social-economic results of such developments there can be no essential retrogression when the war is over.

#### V. LONGSHOREMEN

The arrangement for settlement of disputes among longshoremen at the ports has worked out satisfactorily up to date. As pointed out in connection with the account of its establishment, a new feature of the arrangement was the local adjustment commission at each port. These local commissions, by the effectiveness of their handling of disputes, strengthen the impression produced by the effective work of the local examiners operating under the Cantonment Adjustment Commission, namely, that wherever possible resort should be made to representative local men who command respect in a community by reason of character and impartiality. Their position is strengthened if it is part of a national labor policy; but there is great advantage in their being local. At New Orleans a serious dispute was preceded by demands of longshoremen for materially higher wages, accompanied by new and rigid limitations placed by longshoremen upon the amount of freight which would be handled per man. All matters in dispute were handled by the local commission of three, one representing the Fleet Corporation, the second the International Longshoremen's Association, and the third the carriers. The decision dealt with wages, which were increased, and with working conditions, and has been acceded to by both sides. It laid down the rates per hour for the handling of different classes of freight and also defined certain conditions of work which should obtain at the docks. The Galveston commission was also called upon on October 9 to deal

with a strike on the docks of one of the large coast lines at that point. The decision dealt with wages, which were increased, and with working conditions, and this too has been accepted by both sides.

At New York the local adjustment commission could not be constituted as at other ports, because of the position of the employers at the docks. They maintained that they had not signed the memorandum for adjustment of disputes and were not bound by it, and that the Longshoremen's Association was not entitled to a representative on any local commission because it did not have a majority of the workers on the docks. This difficulty was solved by an agreement on the part of all parties to submit a serious dispute which was pending at that time in New York to a committee made up of a representative of the Shipping Board, a representative of the Department of Commerce and a representative of the Department of Labor. This commission conducted an extensive hearing in New York with reference to wages, hours, and conditions at the docks, at the conclusion of which on November 15, 1917, it announced complete minimum scales of wages and also an outline of working conditions (1) for harbor and river docks and passenger vessels, (2) for ferryboats, (3) for tidewater boats, and (4) for lighters and barges. On December 28, the New York commission was called upon to adjust another dispute with reference to wages paid by a steamship line at New York and Brooklyn.

## VI. MUNITIONS AND SUPPLIES

After the establishment of the machinery for adjustment in war production in the summer and early autumn of 1917, the establishment of some general plan of a similar nature for dealing with disputes in connection

with the production of munitions and supplies was looked for. Up to the present time various attempts to set some such general plan on foot have failed of success. During October, however, there was consummated an adjustment device in one field of supplies production, namely, harness and saddlery for the Quartermasters' Department and for the Ordnance Department in the War Department. This commission was to be composed of four members, of which two were to be appointed by the Secretary of War, to represent the public, one by the manufacturers, and one by the United Leather Workers' International Union; one of the members appointed by the Secretary of War to be designated by him as Chairman; the Commission to adjust all differences between contractors and employees engaged in the production of articles under agreements to which the United States was a party. It was provided that in the event that any changes in wage scales should be made by the commission, compensatory adjustments should be made in the interest of the contractor in accordance with the recommendations of the commission.<sup>1</sup> The agreement was signed by practically all of the contractors having harness or saddlery contracts with the War Department. The Secretary of War appointed under it an officer from the Quartermasters' Department and also one from the Ordnance Department, the officer to sit in any particular dispute being determined by the department interested therein. This agreement presents several interesting departures from those preceding it. But it has this fundamental feature in common with the others, that a direct representative of organized labor sits in council over the wages to be paid to the workers. The contractor has a representative, as is also the case with

<sup>1</sup> For text of the agreement see page 386.

reference to the longshoreman's board. Up to the present (January, 1918) the board has handled two disputes and has also done some service in the standardization of wages.

The Board of Control of Labor Standards in Army Clothing, working under the Quartermaster's Corps, may be treated in connection with labor adjustment for munitions and supplies production. The adjustment of disputes, however, has been its minor function. Its work since October, 1917, has been primarily constructive and preventive, altho its usefulness has been greatly impaired by reason of the fact that the workers in the clothing industry are divided into two bitterly opposed unions — the United Garment Workers of America, affiliated with the American Federation of Labor, and the Amalgamated Clothing Workers, a strong "secessionist" organization. Largely because of this division, the member of the board of three who has represented the interests of labor, instead of being from the labor group, is the General Secretary of the National Consumers' League, appointed by the Secretary of War. In the adjusting of the five labor disputes which it has considered the board has been confronted with situations of considerable complexity, and its success has not been marked.

As in the case of the Cantonment Adjustment Commission, the corner stone of the board's power to keep the peace in industry, has been the contract between the government and the clothing contractor. So long as the government continues production on the private contract system, and would avoid following the British precedents as regards the commandeering of plants and the compulsion of labor, industrial peace and continuity of production can hardly be secured unless the government obtains under its contracts for production the right to control the contractors' labor policies.



The next step needed in control must, in the absence of statute, be also obtained through the medium of the contract. If the contract while naming the minimum wage which is to be paid by the contractor, leaves him free to increase his wage, the way is left open for contractors to outbid each other for labor and to produce in that way a continual condition of unrest. There are government contracts where the price to the contractor is based upon certain schedules of prices for raw material and of wages for the labor to be employed on the work, and where the government agrees to pay additional costs incurred by the contractor by reason of necessary increases in costs of material or increases in wage scales; with the proviso, that such increases in order to form a basis for claim for additional compensation must be approved in writing by the government. So great is the temptation under present conditions, for a contractor to make a quick "turnover" of his capital, that at times in order to attract labor from his competitors, he will increase his wages beyond his schedule without even obtaining the consent of the government to such increase. Serious labor disturbances in war production have resulted, and such occurrences must be frequent unless some mode of control is introduced. The only practicable method which suggests itself is to state a maximum wage in the government contracts as well as a minimum wage, and to provide that the contractor shall make himself liable for losses caused to the government by reason of the contractor's exceeding the maximum wage without authority. There is a certain implication of oppressive rigidity in such a course which may prove a source of strong opposition from labor unless the government accompanies it with a fair method of wage determination. But given such a method, it would seem that the dangers of the maximum scales in govern-

ment contracts are not serious enough to constitute a real objection to their use. As yet there seem to be very few government contracts which contain such clauses, accompanied by the agreement of the contractor to remain within their limits.

The only general approach to regulation of this kind is in a form of army clothing contract authorized for the Quartermaster's Corps on October 31, 1917. Altho containing no maximum wage feature, it seems to enforce the most thoroughgoing governmental control yet evolved through the medium of a contract. It recites that the contractor has qualified as such, by reason of his compliance with proper labor standards, which he promises to maintain throughout the period of performance; that the Board of Control shall at all times have access to the plant and to the contractor's books for inspection, and may cancel the contract on account of the contractor's maintenance of improper labor standards; that labor disputes shall be subject to adjudication of the board, its decision to be final, and in the event that it increases wages by way of settling disputes or otherwise, such increase is to be the basis of a claim for additional compensation to the contractor. The most significant feature of the plan of the Board of Control's work, however, has had to do with the wage scale. Because of the recent large and successive increases in labor cost it has become the practice in contracts to recite that the contract price is based upon a schedule of wages attached and that, if it becomes necessary to increase wages beyond the schedule rates, the contractor will increase the price to correspond with the consequent increased labor cost. The wages so scheduled have customarily been, both in private and in government contracts, the wages prevailing at the time in the vicinity. Here the Board of Control originally

planned to inaugurate a most important step toward insuring industrial peace, namely the promulgation in the army's newest clothing contracts of schedules of minimum piece rates based not upon the then prevailing rates, but standardized throughout the clothing industry upon the basis of exhaustive investigation by the board's experts. Where operations are encountered in piece-work making for which there is more than one established method of production, rates were to be scheduled for each operating method. Wages carefully determined in this way are not likely during the period of the average clothing contract to need revision. Still, opposition to this policy of wage-making would doubtless have appeared, and the progress of this particular experiment of the Board of Control like other important constructive steps would probably not have been entirely smooth.

The board's other previsory work, with reference to conditions, has been based upon inspection — as regards safety and sanitation, child labor and prohibition of home work. Inspection of home work, child labor and sanitation has generally been by the board's own inspectors, but in New York City the Municipal Bureau of Fire Prevention has made reports to the board, while in many other localities the boards of fire underwriters have done similar service. Up to December 15, 1917, one hundred and twelve firms had been inspected by the board; of these sixty-five were approved, eighteen were entirely disapproved, while twenty-nine were partly or conditionally approved. Where approval was not given, the board's report stated the specific changes which must precede a shop's approval for a contract; in this way firms have been influenced in a number of instances to improve materially their labor standards.

In the latter part of January, 1918, the Quartermaster General, in the course of establishing an industrial service section (along lines similar to the section in the Ordnance Department, presently to be examined) dissolved the Board of Control, retaining its chairman in its place as administrator of labor standards in army clothing. This rearrangement in the Quartermaster's Department will also bring about, in the clothing contract just discussed, material changes, not yet determined.

#### VII. THE INDUSTRIAL SERVICE SECTION IN ARMY ORDNANCE

A highly important plan of preventive work against labor disturbance, in course of development for the War Department's operations, is that of the Industrial Service Section of the Ordnance Department. When it had become evident in the latter part of November that the producing agencies of the government were not combining upon an organized method for insuring sound industrial conditions for production, the Ordnance Department of the Army took the initiative and began the formation of a special section for dealing with the labor problem. Previous to this time, on November 15, 1917, the Chief of Ordnance had laid a foundation for this course, by issuing to his arsenal commanders and to contractors doing work for his department a public statement urging the recognition and maintenance in all shops of a high standard of labor conditions. This statement, under the title of "General Orders No. 13,"<sup>1</sup> modeled somewhat upon the reports issued by the British Ministry of Munitions and incidentally citing Great Britain as an example, emphasized the advantages to be gained in effectiveness of production

by rational conservation of labor power through high standards as to hours, wages, sanitation, holidays, and the like. A special section of the circular having reference to the employment of women urged the eight hour day, the prohibition of night work, an ample period for meals, the Saturday half-holiday, the providing of seats where possible, the limitation to twenty-five pounds of weights to be lifted, the payment of wages equal to men's wages for equal work, and the prohibition of home work.<sup>1</sup>

As the first expression from the Ordnance Department of a distinct attitude toward the labor side of production, General Orders No. 13 was important. But the Department's more recent creation of the Industrial Service Section is the concrete realization of a constructive labor policy. This section is principally preventive, altho it has the adjustment function as one of its activities. Probably without any conscious intention on the part of its organizers of following the pattern presented by the British Ministry of Munitions, the Section has yet developed under a similar plan, combining the functions of the labor supply and labor regulation departments of the Munitions Ministry. If allowed to develop further, it will probably point the way for the formulation of methods to be followed by any central government machinery which may be created for dealing comprehensively with the war labor problem. Grounded directly upon the planning section of the Ordnance Department, it has several divisions. The first is administrative; the second is informational, for collecting statistics on labor requirements and labor supply, and for conducting research on standards of

<sup>1</sup> For the official summary of General Orders No. 13 see page 387. A statement substantially identical was issued on November 19, 1917, by the Quartermaster-General as "Circular No. 18" to Depot Quartermasters, Inspectors, and Contractors.

wages, conditions and performance of labor and methods of handling labor in production. The third is the employment management section, which will undertake to improve methods of employment management by making a study of each plant, its system of "hiring and firing," and the working conditions and living conditions of the employees. Arrangements have been made with Dartmouth College, which has for several years been conducting courses in employment management, for short intensive courses to be given for arsenal officers and men sent from the management staffs of various munitions contractors who are preparing to coöperate in the plan. The fourth department of this section is for adjusting disputes. Fortunately the acute situations in ordnance production have of late been so few and of such a nature as to admit of being handled by one officer, so that up to this time there has been no pressing necessity for the creation of a representative quasi-judicial board for this work. With the exception of the department to be separately considered in the next section of this paper the Department of Women's Work completes the organization of the Industrial Service Section up to this time. If the Section is now allowed to push its work steadily it can, as pointed out above, become the proving laboratory for a central government agency dealing with labor in war production, which is to be expected as a development within a few months.

#### VIII. HOUSING

A further function of the Industrial Service Section in the Ordnance Department deserving special attention, relates to the supply and distribution of labor, partly by wage standardization, partly by improvement of transportation facilities, most of all by housing arrangements.

The problem of transporting workers is being approached in distinctively American fashion. By quick, ingenious adaptations of existing suburban transportation facilities, the Supply and Distribution Department of the Section has already relieved labor shortages in munitions plants and, in more than one instance, has made unnecessary the construction of new housing facilities which the situation seemed, upon first survey, to demand. A bill is now pending to permit the requisitioning of street and interurban railways and the increase of their facilities for effecting better transportation of munitions workers.

Special attention is being given to the housing problem. Here again we find both British tutelage and American invention. For many years Great Britain has carried on large housing projects through its cities, and during the war, owing to the sudden concentration of workers at many points, has entered on housing operations of great magnitude. These housing undertakings of Great Britain at munition centers have gone far toward reducing some of the worst problems of war-time labor. During the first six months of America's participation in the war, even with the British example before it, the government at Washington, took up the housing policy in none of its producing departments. Now, however, both the Fleet Corporation and the War Department have large housing projects under way. While the question is not settled, the trend of opinion in the producing departments seems to be in favor of permanency for the workers' houses to be erected, whenever conditions permit. Whether or not we shall see in these housing projects any approach to the artistic grouping and design which have appeared in such British developments as are to be seen, for instance,



at Woolwich and Eastriggs in England,<sup>1</sup> is a question. But with the example of England and the extensive American literature dealing with her activities in this direction, we can hardly fail to profit in America, to some extent at least, from British precedent.

Inordinate rents sometimes produce as much waste of labor power through discontent and instability as do inadequate facilities. At some points the rents have followed an upward course corresponding so closely with wages as to absorb a large proportion of every increase. Some remedy should, if possible, be found. A possible resort is the principle of the Fair Rents Act of New South Wales, enacted in 1916.<sup>2</sup> This law establishes a Fair Rents Court. Any lessor, or any lessee not in arrears, may apply to the court to have the fair rent of the dwelling-house leased by or to him determined, fair rent to be established with a view to producing a net rent, of not more than 2½ per cent above the rate of interest charged on overdrafts by the Bank of Australia, nor less than that rate of interest, and to remain in force three years. But a principle of this kind could be applied by the federal government only in territory theretofore taken under its control under its war power, and in any case would doubtless be too cumbrous in execution. If the government should be ready to take control of areas surrounding shipyards and munitions plants, it could, with more practicability, requisition the residences within them and house workers in them on its own terms.

The housing situation at munitions centers illustrates vividly the fact that if the labor problem is to be handled effectively, it cannot be done without a cen-

<sup>1</sup> See *Journal of American Institute of Architects*, September, October and November, 1917.

<sup>2</sup> See the *Journal of the Society of Comparative Legislation*, New Series No. xxxviii, July, 1917, p. 63.

tral organization for guiding the production program. During the first months after April 2, 1917, the various producing departments, and even various agencies within the same department, were placing their contracts with little regard for the contracts which other governmental departments or agencies might have placed in the same city or district. Such contracts in many cases, as at Bridgeport, called for the erection of new plants. The consequence was that workers swarmed into some cities in numbers far exceeding their housing facilities, while in other cities, well fitted for similar production and with adequate facilities, the production capacity was not even strained. A large proportion of the most responsible mechanical labor is not mobile and thousands of this class are even today withheld by maladjustment of contracts and by their own inertia from contributing their power to the national effort. In the war production industries at such contract-glutted points as Bridgeport, Conn., Wilmington, Del., and Norfolk, Va., there are wretched living conditions due to overcrowding, and there are also impressively high percentages of labor turnover and a low percentage of efficiency. The Industrial Service Section in Army Ordnance now plans to prevent the placing of contracts where they are already thickly planted. But clearly this illustrates the sharp necessity for a central agency which can insure priority in the placing of contracts as between government producing departments and can also provide, on a statistical basis, that contracts are placed where the back pressures of labor scarcity or of the housing problem will not set in. From the point of view of the preemption of materials, particularly such as chemicals and rare metals, the same considerations argue for a central director-umpire over competing war production de-

partments. The British Ministry of Munitions is more than such an agency, since it is directly charged with production; but geographical allocation of contracts with reference to the labor supply has from the first been one of its concerns, while it has frequently moved manufacturing establishments from one point to another in order to bring about a better industrial equilibrium. It is to be hoped that the central labor agency which may now be expected to evolve at Washington, will be closely integrated with the technical planning and progress-recording work of the several governmental producing departments.

#### IX. OTHER ADJUSTMENTS AND TENDENCIES

There are some other events and some discernible tendencies, either relating to the government's treatment of its war labor problems or resulting partly from them, which are of such importance that some reference at least should be made to them here.

On December 26, 1917, when the President, by proclamation assumed control of the railroad systems of the United States, the Director General of Railroads found a disturbed situation in the demands and plans of mechanics working in railroad shops. About 150,000 workers are included in the following six organizations, which compose the "Mechanical Department of the Railway Employees' Department" of the American Federation of Labor: the International Association of Machinists, the International Brotherhood of Boilermakers, Iron Shipbuilders and Helpers, the International Brotherhood of Blacksmiths, the Amalgamated Sheet Metal Workers of America (including pipefitters), the International Brotherhood of Electrical Workers, and the Brotherhood of Railway Carmen. This depart-

ment of the Federation of Labor, commonly known as the "Railroad Shopmen," has been organized into a compact group only since 1912, and has not succeeded in gaining a foothold for collective bargaining on some large railway systems, as for instance, the Louisville and Nashville Railroad Company, the Illinois Central, the Atchison, Topeka, and Santa Fe, the Southern Pacific Railway and the Union Pacific Railroad. None the less, it has won a sufficiently strong position to be able to make contracts covering most of the trunk line trackage of the United States. These contracts are not made for a fixed period of time and are terminable on thirty days' notice; they are frequently effected with a "system" of roads by an entire group of unions as a unit, through the railroad shopmen. The ultimate aim of the shopmen has been to bring about collective and simultaneous bargaining between all shopmen's unions and all railroads in one universal agreement, covering the country; and the policy of having contracts terminable on thirty days' notice is probably pursued in part with a view to being able at any time to terminate all agreements with single roads and to substitute for contracts so abrogated, a "blanket" agreement between all railroads and all railroad shopmen as two contracting units.

According to the Interstate Commerce Commission statistics, the wages of shopmen in 1915 and 1916 were nearly stationary. Taking the machinists' wage as an index, all railroads showed an average wage over the entire country of about 40 cents an hour, in the two years between June, 1914, and June, 1916.<sup>1</sup> Since that time there have been large advances. Agreements between railroads and shopmen in May and June, 1917,

<sup>1</sup> See 27th and 28th Annual Reports on Statistics of Railways in the United States, pp. 27, 28 in both.

on the thirty day cancellation basis, were founded in general upon a scale for machinists east of Chicago of from 50 cents to 52 cents an hour, and west of Chicago of from 52 cents to 56 cents an hour. In the meantime, the cost of living has increased considerably and the shipbuilding program has just brought the machinists' compensation in Pacific coast shipbuilding yards, as has been seen above (see page 344), to  $72\frac{1}{4}$  cents an hour on an eight hour day basis. Under such circumstances dissatisfaction was to be looked for. The Director General of Railroads found that the Michigan Central was confronted with a strike of shopmen which had been voted on January 2, involving about 1,400 shopmen. On the Chicago and Great Western a demand for compliance with the western standards had been followed by a call for a strike on January 8, about 1,800 shopmen being involved. The most serious situation was with reference to the entire western district — roughly speaking the district west of Lake Michigan and of the Mississippi River. A demand had been made for a minimum of \$5.00 a day, or  $62\frac{1}{2}$  cents an hour for an eight hour day, for men in the metal trades; a minimum of \$4.50 a day, or  $56\frac{1}{2}$  cents an hour for an eight hour day for carmen in classifications where an apprenticeship is served; and of \$4.00 a day, or 50 cents an hour for an eight hour day, for other experienced carmen. The matter had gone so far that a general strike vote had been taken, on all roads on which the shopmen are organized, and a meeting had been arranged at Kansas City for January 14 for making final arrangements for a concerted strike.

The Director General at once took up the situation with one of the Executive Council of the shopmen and a preliminary understanding was reached which averted the immediate difficulties and will probably lead to

adjustment. The fact that five out of the seven members of the Executive Council of the shopmen had been signatories and active supporters of the arrangement under which the Shipbuilding Labor Adjustment Board had been operating doubtless contributed to the success of these negotiations.

Mention should also be made of adjustments which have been successfully made in connection with wages of coal miners. Here the government has had the active support and assistance of the officials of the United Mine Workers of America, one of the constituent bodies of the American Federation of Labor. In October the President of this union gave up his position, and came to Washington as an assistant to the Federal Fuel Administrator; in that capacity he has since been of signal service.

This case (the public service of the president of the Mine Workers) is one of several of a similar nature. In August the president of the Building Trades Department of the American Federation of Labor was invited to become and did become a member of the Emergency Construction Committee of the War Industries Board, which has had the responsibility of recommending contractors for work on the cost-plus-percentage basis, in emergency construction for various branches of the army. His participation was brought about through the influence of the Cantonment Adjustment Commission, which had discovered that the accidental choice of a material proportion of contractors with a particular hostility to union labor was making it unnecessarily difficult to maintain generally open shop conditions. About the same time an official of the Granite Cutters Union became a member of the War Industries Board of the Advisory Council of National Defence. Later, the vice-president of the Brotherhood

of Railway Trainmen and an official of the International Typographical Union became members of the Food Administration. Again, when the Advisory Commission of the Council of National Defence organized a Commission on Housing, the secretary-treasurer of the Building Trades Department of the American Federation of Labor was appointed a member. These selections have distinctly influenced the attitude of a large section in the labor world toward the government's war work. In some instances they can be traced directly to the presence of labor men on the adjustment bodies. In any case the presence of labor men on administrative bodies is of fundamental importance, because it begets a confidence that the labor standards set up under government auspices are established with due regard to the claims of labor. It must be admitted, however, that the presence of labor officials connected with the American Federation of Labor on government boards does not always assist the government in dealing with certain classes of disputes. For instance in connection with the Board of Control of Standards in Army Clothing, it was necessary to exclude such representatives from membership, because of the presence in the production field of a strong rival organization. Again, the situation in the far West and certain parts of the seaboard, in connection with the handling of freight and the operation of ships, where the International Workers of the World are strongly organized, the presence of American Federation of Labor officials on government boards is a hindrance rather than a help. This was illustrated by the inability of the President's Mediation Commission to deal with the extremely grave conditions interfering with the production of spruce and other lumber in the Northwest. Some different way of handling such problems must be devised.



A settlement of interest to the entire country was effected in the eastern part of the state of Washington about the middle of December, through what may be called a spontaneous adjustment. For a number of years there has been a seemingly irreconcilable conflict between the timber workers of the state of Washington and the lumber operators. The underlying causes for the condition were to be found in irregularity of employment, in isolation, in bad housing conditions and in a scale of wages which, considering all these grounds for complaint, was too low. For a year or two the contest raged particularly about the eight hour day; not so much a protest against long hours, as a measure for increasing the day's pay through the application of overtime rates. The International Workers of the World have been strongly organized in the lumber camps and they have made their principal fight on that issue. In 1917 the lumber operators, who had contended that the granting of the eight hour day would lead to their being excluded from competition in the north central states with the southern yellow pine producers, obtained the introduction by Senator Jones of Washington and by Senator Poindexter of the same state, of two separate bills for preventing the passage in interstate commerce of lumber upon which labor employed has been permitted to work more than eight hours in any day. Neither of these bills progressed toward enactment. None the less, in the early part of December, 1917, the lumber producers of eastern Washington voluntarily adopted the following program, to be applicable to that vast area of timber land of eastern Washington and northeastern Oregon known as the "Inland Empire." First, the eight hour day was established in all mills and lumber camps, effective January 1, 1918. Second, the lumber operators were to

organize and at once employ an experienced labor expert to install at each camp and mill a labor department, headed by a manager trained, if possible, in the modern methods of employment management, who was to take over all authority of "hiring and firing," leaving no such authority to the foremen. Third, the association of operators should at once undertake in their plants a standardization of camp sanitation, of labor camp recreation, and of the camp mess; and fourth, the association would coöperate with the University of Washington in the maintenance of a short course of instruction for employment managers. Certain members of the faculty of the University of Washington have been largely instrumental in bringing about this arrangement; and one of them has been selected by the Secretary of War to bring about if possible some similar adjustment of labor conditions on the coast, where the lumber operators are still maintaining the nine and ten hour day and have made no substantial concessions as to working conditions. The tension there is especially grave on account of the interruption to the spruce industry, upon which the aircraft program of the army is largely dependent.

An account of labor adjustment during war time would be incomplete without some reference to the effective work done under the state councils of defense at various industrial centers. The most conspicuously successful work in this direction probably has been done under the Committee on Public Safety in Massachusetts. But this field of activity is perhaps outside the scope of the present discussion, which is concerned mainly with national developments.

## X. THE PRESIDENT'S MEDIATION COMMISSION

Up to this point we have considered only those quasi-judicial bodies for the adjustment of labor disputes which rest on voluntary agreements entered into between the government on the one side and organized labor on the other. The Cantonment Adjustment Commission was the forerunner, based upon the first agreement ever entered into between representatives of the United States and representatives of labor; and this has been followed by a series of bodies erected upon similar principles. In the operation of these extra-legal bodies, as we have seen, there has been an insistent recurrence of the problem as to the extent to which local unions involved in a dispute would yield their right to strike in pursuance to agreements made by their national leaders. Actual settlements came to be made through local agreements of which the frame-work was prepared by the national board and which were signed by local employers and local union officials. Examples of this were at Portland in the settlement of the ship-building strike and at seaboard ports in connection with longshoremen strikes.

The President's Mediation Commission is quite different. It is the only national labor adjustment body created under war conditions which is not based upon a contract between the government and national labor leaders in the American Federation of Labor. Altho it is too early to appraise its work, owing to the comparative recency of most of its activities, one feature of that work is conspicuous, namely, the repeated resort by the commission in the settling of disputes to the promotion of local agreements between the employers and the local unions.

On September 19, 1917, at a time when there was much unrest and not a little violence in different parts of the far West, the International Workers of the World being largely concerned, President Wilson addressed a memorandum to the Secretary of Labor, stating that he was desirous of bringing about some kind of working arrangement in the mountain region and on the Pacific coast for the elimination of labor difficulties, and that for the accomplishment of that purpose he was appointing a commission of five to visit localities where disagreements had been most frequent. The commission consisted of the Secretary of Labor, two representatives of employers and two of organized labor, together with a secretary specially designated. The President requested that the commission visit, in each instance, the governor of the state to advise him of the commission's intentions and that it "deal with employers and employees in a conciliatory spirit, seek to compose differences and to allay misunderstanding, and in any way that may be open to them show the active interest of the national government in furthering arrangements just to both sides. Wherever it is deemed advisable conferences of employers and employees should be called with the purpose of working out a mutual understanding between them which will insure a continued operation of the industry on conditions acceptable to both sides."

The Commission left Washington on September 29, 1917, and went directly to Arizona, where serious disputes were in progress in the copper mines. That copper field produces somewhat more than 25 per cent of the total copper output of the United States, and a considerable proportion of the operations had been discontinued owing to strikes which had been in active progress for a period of two to four weeks prior to the arrival of the commission. The Arizona copper field is

divided into several districts. In some of these districts the American Federation of Labor had promoted organizations to an extent practically negligible; while the Clifton District was organized to about 90 per cent of the man-power, and the Globe-Miami District was organized to the extent of from 30 to 40 per cent. The International Workers of the World had developed considerable strength in the Bisbee District and in one or two others. For a year or more machinery has been in existence for dealing with grievances of workers, not through any agreements between the employers and labor organizations, but through rules promulgated by the employers. These arrangements were similar in the various districts, in providing for a grievance committee which was to bring complaints to the attention of the employers, and in providing for a mediator to be summoned in the event of necessity. The rules thus instituted by the mine owners also set forth in some fullness the general standards governing wages, hours, and conditions. The disputes were largely concerned with demands for higher wages, but they also involved labor conditions. As a general policy, the commission built upon the machinery which it found already in existence; amplified and considerably strengthened the rules already in force for dealing with labor disputes, and by procuring the express written acceptance of the code thus created both by the employers and by representatives of unions, affiliated with the American Federation of Labor, transformed the code into what was in effect, a working agreement between employers and employees. The principal provisions of the working agreement which was thus established by the Mediation Commission at Clifton, Arizona, are as follows: (1) Each company is to continue to recognize the existing grievance committee for each mine or department, the dis-

strict committee to be discontinued. (2) A United States Administrator and two alternates are to be appointed by the Commission. The administrator who was named is one of the most successful commissioners of mediation and conciliation connected with the Department of Labor; his success in handling mining disputes in the past decade has been conspicuous and his influence in the Arizona section is already well-established. The two alternates are men who enjoy a high standing in Arizona, where they are residents. (3) When an individual worker is not able to secure an adjustment of his personal grievance he shall have the right to apply to the United States Administrator with the same force as tho his case had been presented by the grievance committee. If the grievance committee and the management have been unable mutually to adjust differences in dispute or if the grievance comes direct to the United States Administrator through an aggrieved worker, the decision of the United States Administrator shall be final and binding upon both parties. Workers may have their case presented by representatives of their own choosing. (4) There shall be no discrimination between union and non-union men. (5) After the mine shall have reopened and the work shall have been thoroughly reestablished, the Administrator shall institute an investigation into the wage scale of the district and determine if an adjustment be necessary "having regard to efficiency or lack of efficiency and to the present cost of living, as well as to the financial ability of the companies." In the event that the Administrator determines that wages shall be increased he shall recommend to the President of the Mediation Commission a new wage scale applicable to the entire district. If the wage scale thus recommended by the Administrator allows a fair profit to the companies

under the existing price of copper the President of the Commission shall at once promulgate such new wage scale and the companies shall pay all increases provided for by such new scale as of the first day of the return of the men to work. If it should develop that the wage scale awarded by the Administrator does not leave a fair profit to any company under the existing price of copper, the President's Mediation Commission shall recommend to the President that such company be permitted to obtain an increased selling price which will enable it to earn such fair profit; and the scale recommended by the Administrator shall not be made effective by promulgation by the President's Commission until such increased selling price has been obtained. In order to fix the wage scale and in order to determine any possible discrepancy between a fair profit and the actual profit the Administrator shall have complete access to all the records of all the companies and shall have authority to employ such expert assistants as he may deem necessary. (6) Neither strikes nor lock-outs shall take place during the period of the war.

With the exception of the provision making the final establishment of the increased wage contingent upon a higher price being obtained for the product in the event that the increased wage, upon the basis of the fixed price, prevents a fair return, the arrangements established by the Commission in the Jerome, Bisbee, Warren and Globe-Miami districts were substantially similar to the arrangement at Clifton. Work in the Arizona fields has been resumed, with a fair approach to a normal output. As yet no increases in wages have been established by the United States Administrator in that district.

The Commission also made investigations in the Pacific coast states with reference to labor conditions, particularly in the mining and lumber industries, on the



basis of which it made reports to the President. Its admirable and successful intervention in the telephone strike, which involved the telephone service in California, Oregon, Washington, Idaho and Nevada, need not be treated here, since the activity concerned is not primarily one of war time production. An attempt was made by the Commission to deal with the labor situation in the northwestern lumber camps and mills, but numerous conferences closed without definite results. The situation is extremely complicated, presenting as it does, not only grievances of labor organizations affiliated with the American Federation of Labor, but also long-standing complaints of the International Workers of the World, a section of labor with which this commission was not well fitted to deal on account of its containing two high officials of the American Federation of Labor, with which the I. W. W. has often been on terms of hostility.

In early December a serious situation had arisen in the packing plants. The trouble centered at Chicago, but extended out to the branch packing establishments in a number of Middle West states. The Mediation Commission succeeded in making an agreement direct with a number of international unions, affiliated with the American Federation of Labor.<sup>1</sup> As in Arizona, a labor administrator was agreed upon, to act as arbitrator, his decision to be binding upon all parties to the agreement. It is to be noted that this agreement does not bear the signature of any of the employers; a circumstance which necessarily makes the effectiveness of the agreement dependent upon the influence which the Mediation Commission can bring to bear upon the packers in the event that a dispute is submitted by the workers to the administrator for arbitration and a decision is rendered

<sup>1</sup> The text of the agreement is printed below, see page 390.

by him adverse to the employers. For this reason, and also because of continued unrest among the employees, the outcome in this industry must be awaited.

## XI. THE DEPARTMENT OF LABOR

Important developments occurred during the last few weeks of the year 1917, looking toward wider scope of the Department of Labor and of the Secretary of Labor, with reference to the regulation of labor in war-time production. There have been two views, conflicting somewhat, with reference to the function of the Secretary of Labor and of his department in connection with such activities. One view may be said to have been the one presented to the administration informally by members of the labor department of the British Ministry of Munitions, who visited this country in the autumn of 1917. It is that the proper agency for dealing with the regulation of labor during the war is the producing departments of the government. It is this view which led in Great Britain to the establishment of elaborate labor regulation machinery under the Munitions Ministry, leaving the adjudication of actual disputes as the only function with reference to labor lying outside of the Ministry of Munitions proper. The other view is that the Department of Labor is the natural agency of the government at Washington for dealing with labor problems, and that the war presents a natural occasion for strengthening the department and extending its usefulness. Three branches of activity important for this work have been well launched in the Department of Labor since it was established in 1913. First, a well organized department of statistics; second, a department of arbitration and conciliation; and third, a labor exchange or employment service. None of these

activities has been sufficiently supported by Congress to enable it to flourish strongly, yet they have already done valuable work.

The principal argument in support of the British view as applied to the American situation is that the Department of Labor has no direct connection with the departments of the government engaged in production of ships, munitions and supplies, and that such a dislocation must necessarily discount largely the usefulness of the Department of Labor in dealing with labor problems arising in these other departments. So much as this can be said with certainty: if the Department of Labor, or if the Secretary of Labor is to be entrusted with the administration of labor matters in connection with production at this time, such administration must have, for its foundation, machinery within each department so connected with the planning and progress-recording work as will give to the labor administration during every moment an intimate insight into the actual conditions bearing upon production. If this cannot be accomplished, then it would seem that the British view is the correct one; that the labor problem in war time must be treated as primarily a production problem and that it should be handled directly under such part of the administration as is directly vested with responsibility for production.

Since the early summer of 1917 it has been plainly evident that some responsible agency should be at work offsetting the violent maladjustments of the labor supply, many of which are direct results of the disturbed conditions of war time. This necessity first became apparent in connection with the wasteful migrations of labor which took place in various sections of the country during the building of cantonments. Irresponsible newspaper advertisements in cities throughout the

country, inserted by contractors or by employment agents, brought to the cantonments at a number of points hundreds of workers who could not be used. In many cases, having been subjected to the expense of long travel and of advance fees paid to employment agents, they actually became subjects of local charity before they could get employment, or were able to return to their homes. The same process has been repeated at shipyards and at munitions plants.

Obviously it was for some central agency to prevent such occurrences if possible, to collect accurate information as to the exact labor necessities, present and prospective, of the various contractors working for the government, and by judicious advertising in sections known to have a superfluous labor supply to bring labor to the points where needed in the amounts needed. To be successful, such a service must be based upon a real knowledge of the needs of each department. In order that the needs of each department may be known, in turn, each department must conduct a thoro planning system, which can translate its work at any future period into man-power. By reason of its progressive policy of the two years preceding, the employment exchange service of the Department of Labor was an instrument which could have been adapted to such use in the summer of 1917, had the producing departments of the government been in a position to avail themselves properly of such service. The Department of Labor did exert some influence upon the situation, but was without resources and without coöperation sufficient to be of any great use in the emergency.

In the meantime, efforts were being made to procure an appropriation for the Department for this specific purpose. On October 6, 1917, in the urgent Deficiencies act, Congress responded with the allowance to

the Department of Labor of the sum of \$250,000 for carrying on its work of conducting labor exchanges.<sup>1</sup> Obviously the sum was inadequate, but fortunately the President was in a position to supply the needs of the Department of Labor out of his own emergency fund by transferring to it the sum of \$850,000. With such resources as a beginning, the Department is in a position through its employment exchanges and allied activities to do effective work in assisting the government to obtain solutions of the recurring problems of labor supply and distribution. This it can do particularly if it will base its work upon a firm and generous coördination with each of the government departments upon which the prosecution of the war depends.

Brief mention will suffice for the bill now pending in Congress, and supported by the American Association for Labor Legislation, for a complete remodeling of the country's entire system of labor exchanges and an amalgamation of the state agencies with those of the federal government. The future of this measure is uncertain. If legislation such as it proposes is enacted, an important new chapter in labor history will open.

For several months prior to January, 1918, it had been fairly apparent that some central directing force was necessary in connection with labor for war production. Considerations, many of which have been referred to in the foregoing pages, had been impressing themselves upon the attention of all who concerned themselves in any direct way with the labor problem. Perhaps the need for such an administrative feature would have

<sup>1</sup> The appropriation was worded as follows: To enable the Secretary of Labor, during the present emergency, in addition to existing facilities to furnish such information and to render such assistance in the employment of wage earners throughout the United States as may be deemed necessary in the prosecution of the war, including personal services in the District of Columbia and elsewhere, per diem in lieu of subsistence at not exceeding \$4, traveling expenses, and rental of quarters outside of the District of Columbia, \$250,000.

been less insistent if the producing agencies, particularly in the three principal war-making departments, had adopted some method for avoiding congestion of orders, or in other words if they had pooled the labor supply, while at the same time submitting to some umpiring agency the determination of priorities of labor demand in fields of production where labor is insufficient. In November and December of 1917 the working of the Industrial Service Departments of the Fleet Corporation and of the Ordnance Department had already begun to be felt, yet it was clearly recognized that their work must be coördinated in order that the departments should not be in competition. To this end, informal attempts were being made in the month of December for bringing about the establishment of an inter-departmental council, under which the industrial service departments, to be constituted in all producing departments along the lines projected in Army Ordnance and referred to on page 354, would meet and coördinate their standards and policies. The next implication of such a plan was the eventual establishment of some central director, both of labor and production, to whom the inter-departmental council would be advisory. On January 8, the following official announcement was made, by authorization of the Chairman of the Council of National Defence (the Secretary of War) and the Secretary of Labor:

As a result of a series of conferences on the subject of labor policies, the Council of National Defence submitted to the President a program for war labor administration. This program has been approved by the President and he has, accordingly, requested the Secretary of Labor to undertake this administration and to provide for this purpose the following agencies:

1. A means of furnishing an adequate and stable supply of labor to war industries. This will include:
  - (a) A satisfactory system of labor exchanges.
  - (b) A satisfactory method and administration of training of workers.

- (c) An agency for determining priorities of labor demand.
- (d) Agencies for dilution of skilled labor as and when needed.
- 2. Machinery which will provide for the immediate and equitable adjustment of disputes in accordance with principles to be agreed upon between labor and capital and without stoppage of work. Such machinery would deal with demands concerning wages, hours, shop conditions, etc.
- 3. Machinery for safeguarding conditions of labor in the production of war essentials. This to include industrial hygiene, safety, women and child labor, etc.
- 4. Machinery for safeguarding conditions of living, including housing, transportation, etc.
- 5. Fact-gathering body to assemble and present data, collected through various existing Governmental agencies or by independent research, to furnish the information necessary for effective executive action.
- 6. Information and Education Division which has the functions of developing sound public sentiment; securing an exchange of information between departments of labor administration; and promotion in industrial plants of local machinery helpful in carrying out the National Labor Program.

Some of these agencies already exist in part in the Department of Labor. For example, the mediation service, the system of labor exchanges and the Bureau of Labor Statistics can be utilized to the extent they are found useful in carrying out the new program.

It is the purpose of the Secretary of Labor to undertake the work outlined above on an adequate scale. He will call to his assistance as advisors and administrators a well-balanced corps of men of high standing, representing capital, labor and the public. These persons will assist him in formulating and efficiently executing policies which will command the approval and support of employers, employees and the public throughout the United States. The Secretary and his advisors will give early attention to the question whether Congressional action shall be requested.

The Secretary of Labor will bring this new service into touch with the needs of the various departments of Government, including the Shipping Board, in order that labor policies may be made uniform and that the service thus established under the President's order shall adequately meet the needs of the present emergency.



## XII. A FEDERAL WAR LABOR ADMINISTRATION

Here, then, after many months, is the first formal step by the government looking toward a central machinery covering the entire area of government production. It is to be hoped that a structure (whether or not based upon the announcement just quoted) will be erected so strong and so flexible as to withstand the strains that will surely be put upon it. Clearly it must include in its personnel representatives of labor, and in its workings must be based upon a close relation to the planning and progress-recording sections in the several departments. If it intends to perform throughout war industry the function of adjusting labor disputes, it should not impair, without the full sanction of the labor representatives, the adjustment boards which have been erected and are now operating upon the basis of agreements between organized labor and the government. That it should furthermore not impair such industrial service organizations in the government departments as have already been established on a basis of efficiency also seems clear; nor is it likely that this would be done. And in pursuance of a consistent policy, similar industrial service sections which have been planned for navy ordnance, quartermaster corps and aircraft, should be developed without delay.

Taking up in their order the principal items of the program quoted above—the work of procuring labor through the labor exchanges for the various agencies of government production must be founded upon a close coöperation with the planning departments which systematically translate advance production programs into man-power requirements. Any method for training workers must necessarily follow in the main the

principles which have been established already in the shipbuilding industry, where it seems to have been demonstrated that the expedited training of workers can best be carried on in the shops, especially where the pupils are principally skilled men from cognate crafts whose training is to consist mainly in adaptation. Questions of priority of labor lead to the relative claims of producing departments — claims to materials of which the supply is limited and claims to expedited transportation. And these lead further still into vital questions of war policy, which must be decided by those directly responsible for the carrying on of the war — questions as to whether men, food, or munitions are to be given precedence in the use of materials and of transportation facilities. Under proper planning of any given period in war, these priorities must be settled before a labor administrator can decide the right of this or that department to priority in the available labor supply.

No matter what primary function of the proposed labor administration is considered, it is with production that we must begin and end. At first blush, this may seem to imply a disregard for the maintenance of labor standards. But any real retrogression in labor standards is no longer to be feared; we have passed the danger point there. In a swift mental flux such as war alone seems capable of producing, the public mind, largely through the intellectual leadership of the President, has realized an idea which in peace times was still struggling in vain for acceptance — the idea that "welfare" is not charity but efficiency. It is important of course that the workers have strong representation through their governmental spokesman and friend, the Secretary of Labor, and through leaders of the workers themselves who now hold so strong a tactical position that they can hardly fail to retain all genuine welfare

standards on which they insist. But it appears certain that labor standards are in no such danger as would justify the placing of a labor administratorship outside the main current of production into a position where its effectiveness would be impaired.

The chief of the labor administration must wield two kinds of power — the executive power to require information possessed by the officers of the producing sections of the various departments, and authority at least coördinate with that of the head of the executive department within each producing section, to control the action of officers in those sections. This is his executive function. And he must also wield the judicial function with reference to priorities in the labor supply and to conflicting labor policies. He must have authority also over the officers who would be called upon to carry out a decision adverse to their departments. If the labor administrator has not these powers he will inevitably become a figurehead. There seems to be no escape from the conclusion that the labor administration should be a sort of federation of industrial service sections, their respective directors to be advisory to the administrator, but to be subject to his control and to submit to him their conflicting interests for adjudication and apportionment. Such an administrator can be answerable to the President alone, or to some other functionary representing him, be it munitions minister, war cabinet, or other executive agency whose responsibility extends over production in all of the departments.

The Department of Labor under such a temporary emergency system would still have work far beyond its present scope. It could build up its labor exchange system, supplying craftsmen for the government program, and workers from non-essential production for assignment by the labor administrator to expedited

training; it could stimulate special training in public trade schools over the country; it could carry on and extend its mediation work through assigning its agents directly to the industrial service sections of the producing departments; and carry on a continuous investigation and inspection with reference to the maintenance of labor standards in government work, and broaden its already admirable Bureau of Labor Statistics. If the Secretary of Labor, as an individual, were to serve as part of such a labor administration, the closely correlated and effectual coöperation of the Department of Labor in munitions production would be assured.

But this is not all. Certain problems will have to be worked out through the labor administrator as production problems, if the government is to pursue successfully its purpose to avoid hereafter the seizure of establishments and the constraint of labor, and to obtain at the same time a high degree of labor efficiency.

First, the government should have in all its contracts, whether heretofore or hereafter entered into, the clear right to control the contractor's labor standards. To import this right into contracts already let, the War and Navy Departments should be empowered by Congress to requisition and modify their contracts.

Second, if the war continues for any length of time, the problem of continuity of employment of workers must be dealt with. Under private ownership, a management of production has been tolerated which entails the untold economic waste of seasonal fluctuations of work, wasteful migrations of workers and demoralizing periods of idleness. The efficiency engineers have pointed out how, in many industries where these conditions have prevailed, foresight in buying raw materials, in booking orders and in manufacturing can effect a regularization of production which would insure a steady

use of man-power throughout the year. Organized labor in the past has accepted the temporary "laying off" of skilled men as a necessary evil of privately operated industry. But when the government becomes in effect the employer, and especially when idleness is necessitated by the government's own failures in furnishing fuel or materials, or by its own production policies, will labor be laid off from the pay-roll as well as from the shop? Even in private industry the trend of opinion is being now seen when many large employers are shouldering the wages of men over the shut-down period, when the government is prohibiting the use of fuel. The scarcity of skilled labor will doubtless influence the solution of this problem and we may well expect to see a new public attitude toward it before the war is over.

Third, the government will have to deal with the low percentage of efficiency which is appearing to an alarming degree in many munitions plants, and particularly in many shipyards. In some cases this has been due to labor union restrictions, in others to apathy or to hostility owing to continuous agitation, most of it doubtless quite free from connection with enemy agents. It has been partly due to a suspicion of profiteering by the contractors. Congress should help to remove that suspicion as did the British Parliament. But even then the government will need the assistance of union officials to devote themselves seriously throughout their organizations to the attainment by their workers of high standards of production per man hour irrespective of established union restrictions.

Fourth, while the government is reserving to itself the power to force upon contractors such labor standards as may be established under its auspices, among these the rule that contractors shall not discriminate

against union labor, it must be prepared to protect production from interruption by local strikes for unionization of shops or for demands not satisfied by decisions of federal adjustment bodies. The government has been relying upon labor union officials, whose control of labor is only partial and uncertain, for bringing about that voluntary local restraint which must, if possible, be made to take the place of any governmental restraint. If the unions prove unable to furnish this element of stability, the government may have to supply it through some method which would still have to be evolved.

LOUIS B. WEHLE.

WASHINGTON, D. C.

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## APPENDIX

### DOCUMENTS ON LABOR PROBLEMS DURING THE WAR

#### 1. AGREEMENT AS TO WORKING CONDITIONS IN THE COLUMBIA RIVER DISTRICT

(1) Eight hours shall constitute a day's work.

(2) All time worked over the regular eight hour day shall be paid for at rate or rates to be established by the Shipbuilding Labor Adjustment Board, including holidays; New Year's Day, Washington's Birthday, Decoration Day, July Fourth, Labor Day, Thanksgiving Day, Christmas Day, and General Election Days.

(3) The employees in each craft or calling in a shop or yard shall have the right to select three (3) of their number to represent them as members of a shop committee. Each member of this committee shall be chosen by majority vote through secret ballot in such manner as the employees shall direct. The Chairman of each craft committee shall be a member of the joint shop committee.

(4) When a grievance arises it shall be taken up by the committee, first, with the foreman, second with the superintendent. In the event the question has not been adjusted the committee shall then

take the matter up with the president of the company. If the matter cannot be adjusted between the shop committee and the president, the shop committee shall have the right to call into conference with the president a representative chosen by the committee. In case the president fails to adjust the matter satisfactorily it shall be submitted to the Examiner to be appointed by the Shipbuilding Labor Adjustment Board as provided in memorandum of August 20, 1917, which is attached hereto and made a part hereof.

(5) Employees shall be paid every Saturday at time of quitting work and in no case shall more than three days pay be held back. This practice to be put in effect as soon as practicable.

(6) Any employee being laid off, discharged or quitting of his own volition shall within twenty-four hours receive all wages due him.

(7) A trained nurse shall be in attendance to render first aid at all times whenever men are working.

(8) So far as practicable and when men are available, all labor in connection with construction work and repairs shall be done by employees in the trade or calling generally recognized as having jurisdiction therein.

(9) All questions relating to basic wage scale and overtime shall be left to the determination of the Shipbuilding Labor Adjustment Board, such determination of wages to be retroactive as said Board shall direct.

(10) Any committeeman appointed hereunder who shall be found to have been discharged without just and sufficient cause after due investigation in the manner herein provided for the adjustment of grievances shall be reinstated with full pay for all time lost.

(11) The question of employing apprentices shall be taken up for adjustment in the manner provided herein for the adjustment of grievances.

(12) In view of the fact that the existing strike was called on account of differences which have now been adjusted, no discrimination shall be practised in the reemployment of the former employees.

(13) It is understood and agreed that any concessions of recognized principles by either party to this agreement shall be without prejudice for the sole purpose of assisting the Government in the successful prosecution of the war, but that this agreement shall continue during the period of the war.



## HARNESS AND SADDLERY ADJUSTMENT

1. There shall be created a National Harness and Saddlery Adjustment Commission hereinafter referred to as "The Commission," composed of four members, of which two members shall be appointed by the Secretary of War to represent the public; one member by the manufacturers signatory hereto, and one member by the United Leather Workers' International Union. One of the members of this Commission appointed by the Secretary of War shall be designated by him as chairman. Each member, including the chairman, shall be entitled to one vote, and a majority vote shall govern in all cases.

2. The Commission shall adjust all differences now existing or that may hereafter arise between the contractors and employees engaged in the production of articles under agreement to which the United States is a party, including wages, hours, and conditions of labor. The Commission may adopt rules, regulations, and methods of procedure in order to carry this agreement into effect, and all decisions or adjustments made by it shall be binding upon and complied with by the contractors signatory hereto, who have contracts with the United States, and also by the operatives, members of the United Leather Workers' International Union represented in the execution of this agreement by their president.

3. This agreement shall be in full force and effect for the duration of the present war.

4. The parties hereto severally agree that during the war there shall be no interruption of work upon which they are engaged in the carrying out of contracts to which the United States is a party.

5. In the event that any changes in wage scale are made or approved by the Commission in carrying out its functions under this agreement, compensatory adjustments shall be made by the United States in accordance with the recommendations of the Commission.

6. The scale of wages for operatives for work done under contracts to which the United States and the contractors signatory hereto are parties, shall in no case be less than is now in effect.

7. The contractors signatory hereto agree that non-union labor employed in carrying out work under a contract to which the United States is a party shall receive the same rates of compensation as the members of the United Leather Workers' International Union.

(The signatures attached to this document were those of about forty persons, partly contractors, and partly officials of labor organizations.)

SEPTEMBER 26, 1917.

### 3. SUMMARY OF RECOMMENDATIONS TO ARSENAL COMMANDERS AND OTHER EMPLOYERS

CONTAINED IN GENERAL ORDERS, No. 13, OFFICE OF THE CHIEF OF ORDNANCE, WASHINGTON, D.C., NOVEMBER 15, 1917

In view of the urgent necessity for a prompt increase in the volume of production of practically every article required for the conduct of the war, vigilance is demanded of all those in any way associated with industry, lest the safeguards with which the people of this country have sought to protect labor should be unwisely and unnecessarily broken down. It is a fair assumption that for the most part these safeguards are the mechanisms of efficiency. Industrial history proves that reasonable hours, fair working conditions, and a proper wage scale are essential to high production. During the war every attempt should be made to conserve in every possible way all of our achievements in the way of social betterment. For this reason a memorandum summarized in the following outline has been prepared, in the hope of giving publicity to broad policies which, in the opinion of the department, should obtain in establishments acting as its agents in turning out munitions and supplies of war. The complete memorandum may be obtained from the department.

#### I. HOURS OF LABOR

1. *Daily hours.* — The day's work should not exceed the customary hours in the establishment or the standard already attained in the industry and in the community. It should certainly not be longer than ten hours for an adult workman. The drift in the industrial world is toward an eight hour day as an efficiency measure. It has also been shown that hours of labor must be adapted to the age and sex of the worker and the nature of the occupation.

2. *Overtime.* — The theory under which we pay time and a half for overtime is a tacit recognition that it is usually unnecessary and always undesirable to have overtime. The excess payment is a penalty and intended to act as a deterrent. There is no industrial abuse which needs closer watching in time of war.

3. *Shifts in continuous industries.* — Eight hours per shift should be a maximum in continuous twenty-four hour work.

4. *Half holiday on Saturday.* — The half holiday on Saturday is already a common custom in summer, and it is advantageous throughout the year, especially if the workday be ten hours long the other days of the week. The working period on Saturday should not exceed five hours. An occasional shift of two or three hours on Saturday afternoons is unobjectionable if essential, but the addi-

tional hours should be regarded as overtime and paid for on that basis.

5. *Hours posted.* — It is desirable that the hours of labor for every tour should be posted.

6. *Holidays.* — The observance of national and local holidays will give opportunity for rest and relaxation, which tend to make production more satisfactory.

7. *One day of rest in seven.* — One day of rest in seven should be a universal and invariable rule.

## II. STANDARDS IN WORKROOMS

1. *Protection against hazards and provisions for comfort and sanitation.* — Existing legal standards to prevent danger from fire, accident, occupational diseases, or other hazards, and to provide good light, adequate ventilation, sufficient heat, and proper sanitation, should be observed as minimum requirements.

2. *Location of toilets.* — All toilets should be sanitary and readily accessible.

3. *Extreme temperatures.* — Those processes in which workers are exposed to excessive heat — that is, over eighty degrees — or excessive cold — that is, under fifty degrees — should be carefully supervised so as to render the temperature conditions as nearly normal as possible. When extreme temperatures are essential, workers should not only be properly clothed but sudden changes should be avoided.

4. *Lights.* — If any light is at the level of the worker's eyes, it should be so shaded that its rays will not directly strike the eyes.

## III. WAGES

1. *Wage standards.* — Standards already established in the industry and in the locality should not be lowered.

2. *Minimum wage rates.* — It is necessary that minimum wage rates bear a constant relation to increases in the cost of living.

3. *Attitude toward wage demands.* — It is just and wise to consider demands for increase in wages, in the light of facts showing increases in cost of living. The enticement of employees from establishments doing munitions work for the Government is disapproved and should be discouraged.

## IV. NEGOTIATION BETWEEN EMPLOYEES AND EMPLOYERS

The need of preserving and creating methods of joint negotiations between employers and groups of employees is especially great, in the light of the critical points of controversy which may arise in a time like the present. Existing channels should be preserved and new ones opened, if required, to provide easier access for discussion between an employer and his men over controversial points.

## V. STANDARDS FOR EMPLOYMENT OF WOMEN

1. *Hours of labor.* — Existing legal standards should be rigidly maintained, and, even where the law permits a nine or ten hour day, efforts should be made to restrict the work of women to eight hours.

2. *Prohibition of night work.* — The employment of women on night shifts should be avoided as a necessary protection, morally and physically.

3. *Rest periods.* — No women should be employed for a longer period than four and a half hours without a break for a meal, and a recess of ten minutes should be allowed in the middle of each working period.

4. *Time for meals.* — At least thirty minutes should be allowed for a meal, and this time should be lengthened to forty-five minutes or an hour if the working day exceeds eight hours.

5. *Place for meals.* — Meals should not be eaten in the workrooms.

6. *Saturday half holiday.* — The Saturday half holiday should be considered an absolute essential for women under all conditions.

7. *Seats.* — For women who sit at their work, seats with backs should be provided, unless the occupation renders this impossible. For women who stand at work, seats should be available and their use permitted at regular intervals.

8. *Lifting weights.* — No woman should be required to lift repeatedly more than twenty-five pounds in any single load.

9. *Replacement of men by women.* — When it is necessary to employ women on work hitherto done by men, care should be taken to make sure that the task is adapted to the strength of women. The standards of wages hitherto prevailing for men in the process should not be lowered where women render equivalent service. The hours for women engaged in such processes should, of course, not be longer than those formerly worked by men.

10. *Tenement-house work.* — No work shall be given out to be done in rooms used for living purposes or in rooms directly connected with living rooms.

## VI. STANDARDS FOR EMPLOYMENT OF MINORS

1. *Age.* — No child under fourteen years of age shall be employed at any work under any conditions.

2. *Hours of labor.* — No child between the ages of fourteen and sixteen years shall be employed more than eight hours a day or forty-eight hours a week, and night work is prohibited.

3. *Federal child-labor law.* — These and other provisions of the Federal child-labor law must be strictly observed.

4. *Minors under eighteen.* — Minors of both sexes under eighteen years of age should have the same restrictions upon their hours as already outlined for women employees.

WILLIAM CROZIER.

*Major General, Chief of Ordnance,  
United States Army.*

#### 4. CHICAGO PACKERS' MEDIATION

This agreement for arbitration, made and entered into this — day of December, 1917, between Illinois State Federation of Labor, Chicago Federation of Labor, Stockyards Labor Council, International Brotherhood of Stationary Firemen, International Union of Steam and Operating Engineers, International Brotherhood of Blacksmiths, International Association of Machinists, United Associations of Plumbers and Steamfitters of the United States and Canada, International Brotherhood of Electrical Workers, Coopers' International Union of North America, Brotherhood of Railway Carmen of America, and Amalgamated Meat-Cutters and Butcher-Workers of North America, hereinafter referred to as the Unions, the parties of the first part, for their members who are employees of the Companies, and the President's Mediation Commission, the party of the second part,

#### WITNESSETH:

That, whereas, differences have arisen between Armour and Company, The Cudahy Packing Company, Morris and Company, Swift and Company, and Wilson and Company and their employees, involving wages, hours, and conditions of employment; and

Whereas, the President's Mediation Commission, acting in the name of the President of the United States and by virtue of the authority vested in it by him, has made investigations with a view to a settlement for the duration of the war of all existing differences and of differences that may hereafter arise, in order that there may be no interruption, cessation or curtailment in the supplies and services furnished by the Companies essential to the successful prosecution of the war and the military activities of the Government; and

Whereas, the President's Mediation Commission, in view of the national crisis, without the intent of encouraging or discouraging the formation of trades unions, has expressed the opinion that every effort and sacrifice should be made in order to settle such disputes; and

Whereas, the Unions, in view of the national crisis, are willing to accede to the request of the President's Mediation Commission as to the conditions upon which such disputes should be settled;

Now, therefore, the respective parties do hereby mutually covenant and agree as follows:

#### ARTICLE I

The Unions agree that no strikes shall be called during the period of the war.

#### ARTICLE II

The President's Mediation Commission agrees to use every effort to bring about the full performance not only of the letter but also of the spirit of this agreement by all the parties hereto, so that strikes or lockouts will not occur during the period of the war.

#### ARTICLE III

It is further agreed by all the parties hereto:

(1) That John E. Williams shall be the United States Administrator to act under this agreement, and in the event of his failure or inability to act, notice thereof shall be given to the Secretary of Labor acting for the President's Mediation Commission, whereupon an Administrator shall be appointed by the Secretary of Labor with the approval of the National Council of Defence, after consultation with the Companies and the Unions. The United States Administrator shall have power to appoint an assistant or assistants to exercise such powers as are conferred upon the United States Administrator by this agreement, such exercise to be subject to review by the Administrator in such cases, as, and to the extent to which, he deems such review necessary.

(2) That all grievances and disputes on the part of employees of the Companies shall be taken up with the foreman or other immediate superiors of the affected employee or employees, and then, if they cannot be so adjusted, with the superior officers of the Company in regular order until the matter shall have been submitted to the general manager, if not adjusted by some one of his subordinate officers. If any grievance or dispute cannot be thus adjusted, it shall be submitted to the United States Administrator for arbitration by him, and his decision shall be binding upon all the parties hereto. Grievances and disputes may be submitted to any of the officers of the Companies, and to the United States Administrator, by any employee or employees, either in person or through their representatives.

(3) That all other pending and future disputes between the Companies and their employees, in case of inability to agree between

themselves, may similarly be submitted to the United States Administrator for arbitration.

(4) That this agreement shall apply to the Companies' plants in Chicago, Illinois, Kansas City, Sioux City, Iowa, St. Joseph, Missouri, St. Louis, Missouri, East St. Louis, Illinois, Denver, Colorado, Oklahoma City, Oklahoma, St. Paul, Minnesota, Omaha, Nebraska, and Fort Worth, Texas.

(5) That this agreement shall continue in effect, and the parties hereto, for themselves, their successors and their assigns, expressly agree to be bound hereby, during the continuation of the war.

The questions contained in the memorandum attached hereto shall be submitted to arbitration immediately the Administrator assumes his duties.

In witness whereof the parties to this agreement have caused the same to be executed by their respective officers and representatives thereunto duly authorized, all on the day and year first above written.

Illinois State Federation of Labor, by V. A. Olander. Chicago Federation of Labor, by John Fitzpatrick, E. N. Nockels, J. J. Kikuhki. Stockyards Labor Council, by Martin P. Murphy, Wm. Z. Foster, J. W. Johnstone, R. T. McMillen. International Brotherhood of Stationary Firemen, by ——. International Union of Steam and Operating Engineers, by Albert Peterson. Amalgamated Meat-Cutters and Butcher-Workmen of North America, by Dennis Lane. International Brotherhood of Blacksmiths, by Edw. Tegtmeier. International Association of Machinists, by B. H. Rendell. United Association of Plumbers and Steam Fitters of the United States and Canada, by ——. International Brotherhood of Electrical Workers, by William J. Barrett. Coopers' International Union of North America, by Jacob P. Maurer. Brotherhood of Railway Carmen of America, by Wm. S. Foster. The President's Mediation Commission, by W. B. Wilson, Chairman; J. L. Spangler, J. H. Walker, E. P. Marsh, Verner Z. Reed, Felix Frankfurter, Secretary.



## REVIEWS

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### KITSON'S TRADE FALLACIES; KITSON'S A FRAUDULENT STANDARD <sup>1</sup>

THE underlying idea which runs consistently through these two volumes and gives unity to the author's whole system of thought is that government compulsion is better than voluntary agreement among individuals as a means of getting things done. Germany is used more frequently than any other country as an illustration of the effectiveness of government compulsion, and England is the horrible example of the system of voluntary agreement. In spite of the odium in which the author holds the morals and the ambitions of the House of Hohenzollern, he attributes the undoubted economic and military strength of the German empire to its system of government compulsion. The government as a conscious entity has known what it wanted and has gone deliberately about the work of getting it. It has not scrupled to use its power of compulsion whenever it could add a cubit to its stature by so doing. England and other liberalistic countries, on the other hand, have relied upon voluntary agreements among individuals as a means of getting their work done. In many cases this has left important things undone or improperly done, to the disadvantage of the national interests.

In the volume entitled *Trade Fallacies* the author shows (Chapter I) how Germany has begun with the psychological problem and has deliberately, through governmental action, cultivated or created a psychology, not only among her own people but throughout the world favorable to herself, whereas liberal governments have relied wholly on spontaneous good

<sup>1</sup> *Trade Fallacies*. By Arthur Kitson. London, P. S. King and Son, 1917, pp. 296.  
*A Fraudulent Standard*. By Arthur Kitson. London, P. S. King and Son, 1917, pp. 233.

will. Seeing that practically all the world except the Turks and the Bulgarians have taken sides against Germany, a critic might question how successful Germany was in her government-owned psychology factory. But when one considers how slow the world was to take up arms against undoubted atrocities not simply in Armenia, but in Belgium and wherever the Turko-Teutonic power held sway, one begins to see how effective the psychological preparation of the German machine had been. Even the expansion of German trade and commerce, the author thinks, was in part due to the conscious and organized efforts of the German government to create favorable psychological conditions in other countries. The English government loaned no such aid to her exporters, but left them to earn for themselves whatever good will they secured.

In Chapter 2 on "The Financial Factor," the author has an opportunity to develop his favorite monetary theory. He points out how Germany, by using her power of compulsion to force on a docile people a system of paper currency, has been able to finance her war more cheaply than the liberal governments have been able to do. The latter, relying upon voluntary agreement rather than government compulsion, have had to keep a supply of gold in order to make people willing voluntarily to accept whatever paper they have used. On page 22 he states: "Aside from the settlement of Foreign Exchange balances, and payments for foreign propaganda work" (where, by the way, her power of compulsion cannot yet displace voluntary agreement) "gold is of comparatively little importance to Germany at the present time. If the Central Powers were to lose every ounce of gold and silver they have amassed, it would have little or no effect upon the war so long as their foreign trade is cut off. . . . In a closed self-supporting empire which the Teutonic Powers and their Allies may be said — within certain limits — to comprise, its entire business can be as easily, as satisfactorily, and far more economically carried on by a State Bank paper currency system than with a gold and silver currency." He goes on the assumption, however, that there shall be government com-

pulsion on the one hand and willing obedience on the other. "So long as a paper money is made legal tender throughout the Empire for all debts public and private, so long as the government itself honors it and keeps the amounts issued within certain bounds, there is no reason why such a system should not enable the enemy to develop his resources as the United States developed hers so successfully for the whole of the greenback period." Most American economists would probably say that the United States developed its resources during that period in spite of the greenbacks.

Undoubtedly the experience of Germany has been a revelation in many ways as to what can be accomplished by government compulsion. The old style advocates of hard money were in the habit of saying that the government *could* not create "fiat money" and make it circulate. Germany has shown that it can. The advocate of hard money can still say truly that it requires a greater exercise of government authority than most liberal governments are in the habit of exercising or than most democratic peoples are in the habit of submitting to.

The second of the two volumes before us is a more elaborate and detailed attack upon the gold standard and the system of relying upon voluntary agreement in monetary affairs. Government compulsion may do many things if the government will enforce its decrees and if a democratic people will submit to this enforcement. Beyond the elaboration of this general idea the volume contains nothing either in the way of argument or illustration which was not repeated *ad nauseam* during our greenback controversy of the '70's and '80's.

In the first of the two volumes before us the author contrasts the consular service of England with that of Germany, also the banking systems, the trade methods, the attitude of the state toward industry, and the general methods of waging trade war. He argues, under all these heads, that the German system is better for the German than the English system is for the English. The English banker, for example, is just as willing to finance a foreigner as an Englishman even when they are competing for foreign trade. Not only will German banks

favor German enterprise, but the government itself shows marked discrimination, both at home and abroad, in favor of German competitors. Even German courts (p. 182-183) have not regarded a foreigner as having many rights when they conflicted with the interests of German citizens.

T. N. CARVER.

HARVARD UNIVERSITY.

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### HOXIE'S TRADE UNIONISM IN THE UNITED STATES<sup>1</sup>

THE outstanding contribution which Hoxie makes to the study of unionism is psychological. He brushes aside, or rather, reduces to a secondary position, the economic interpretations, whether those of the productionists based on the evolution of tools and machinery, or those based on the evolution and extension of competitive markets. He turns to such non-industrial factors as the social environment of ideas and the subjective differences of temperament. The merely economic interpretations, he holds, may indicate an orderly succession of unionism from one stage of industry to later stages, but the psychological — or as he calls it, the functional — analysis of unionism gives contradictory group interpretations, pluralistic rather than monistic. The underlying group psychology, which differs so widely for different groups, springs from the political, religious, traditional, educational, circumstances into which individuals are thrown and from their own attitudes and aims. Consequently different functional types exist at the same time within the same structural types and in the same economic environment.

The functional classification which he tentatively proposes, distinguishes the four main types of "business" unionism,

<sup>1</sup> Hoxie, Robert Franklin, "Trade Unionism in the United States," Appleton, 1917, pp. 426.

"uplift" unionism, revolutionary, and "predatory" unionism. Two varieties of revolutionary unionism are the socialistic and quasi-anarchistic. Two varieties of the predatory are the "hold-up" and the "guerilla" unionism. This classification is functional, or psychological, because it turns on aims, viewpoints, interpretations, policies, and methods of unions and their members. And these different functional types contend for domination within the same union. Certain of them dominate one union, certain dominate other unions, under similar conditions.

This emphasis on the psychological differences comes most usefully into play when Hoxie takes up the matter of social control. From the mechanical, or economic, standpoint social classes are defined in terms of wealth, occupation, source of income; from the psychological standpoint, according to beliefs and attitudes, which make them see alike or differently. The two bases of classification are not identical, and the former merely gives us a knowledge of conditions and problems, while the latter tells us both what can and ought to be done to improve conditions and solve problems. "If we are to guard and guide the ethical standards of the nation . . . we must know the springs of action of the functional groups which compose it."

After considering, from this functional standpoint, the solutions of the classical economists and both the Marxian and the Veblen socialists, Hoxie works out principles of social control based on maxima and minima within which "we shall apparently have to allow the warring groups to fight out the contest" but which will provide progressively better conditions.

It is in his treatment of the manifold complexities of trade unionism resulting from psychological, mechanical, economic, and governmental influences, that the value of Hoxie's book as a textbook is to be found. The ideal textbook for undergraduates in political economy is usually considered to be one in which the subject is laid out systematically, with plenty of facts and description, well organized, proportioned, and predigested. This hand-me-down method of teaching is perhaps

adopted because teachers are not expected to know the subject through their own researches, and can only pass it on from the manufacturer to the consumer.

But Hoxie's is the dig-it-up method. The teacher is an investigator along with his students. The prospect may seem alarming to teachers accustomed to the usual textbooks, and they will think perhaps that Hoxie is proposing a course for graduates instead of undergraduates. But I am confident that, if they will study carefully the appendices to this book, on "methods" and "thinking out the significance of facts," they will find that his method is not only correct but feasible.

The weakness of the hand-me-down method is recognized in the demand for "collateral readings," books of sources and the like, which give the student something to think about in addition to reciting on the text. Instead of collateral readings, Hoxie has very complete instructions to teachers how to secure and use the sources themselves — constitutions, by-laws, trade agreements, papers, interviews — for both employers and unions. With these obtained in proper proportions by each member of the class, Hoxie sets them to digging out their significance.

He shows the great complexity of unionism, and helps to get out of the maze by his classification of "structural" and "functional" types. He runs this down till he finds the "essence" of unionism and the interpretation of types. Then, to give the proper setting and connect unionism with the economic and political conditions, he gives, not an "historical narrative," but an historical analysis of the union types as they succeeded each other in adaptation to conditions. This leads to very real and vivid contrasts between revolutionary and evolutionary unionism — I. W. W., syndicalism, railway brotherhoods, American Federation of Labor, Knights of Labor, and so on. Employers' associations are treated in the same way.

Then come the fundamental concepts of the law, and the conflict of its individualism with the collectivism and group psychology of unionism, and this connects the attitude of employers as contrasted with that of unions. The whole is

focused on the ever-recurring conflict over "efficiency," and here Hoxie's studies of scientific management have put him in position to define the issues. Finally the union movement is resolved into an analysis of social classes, class struggle, and the contrasts, especially between the socialist position, the classical economist's, the business man's position, and the "progressive-uplift" position. All leads up to the great problem of social control, and a "constructive social program."

No student or teacher, after following this book and method, will have a ready-made solution for different kinds of unionism, something that will be upset when he comes to dealing with a strike or a proposed compulsory arbitration law. But he will have a thoroughly critical attitude towards every allegation of fact; a determination to go after the first-hand sources of information; a capacity to handle and interpret the sources; a live sense of the relation of the facts to the world problem of modern industry and politics.

In fact, the book seems to me, notwithstanding the lack of artificial systematizing and pruning which Hoxie might have felt constrained to adopt had he lived to see it through the press, superior to any other in the way of getting the teaching profession into the ideal notion and method of teaching.

JOHN R. COMMONS.



## NOTES AND MEMORANDA

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### THE SUPPLY PRICE OF LABOR

PROFESSOR TAUSSIG concludes his critique <sup>1</sup> of my book on Profit and Wages with a significant suggestion. Accepting in large part my objections to the time-preference and abstinence theories, but rejecting my theory of the supply price of labor, he indicates that what we "perhaps" must come to, is an "agnostic doctrine." "If we give up the notion of a regulating rate of 'time-preference,' or the similar one of a minimum return necessary to induce abstinence and saving, we have no 'normal' rate of interest. And if we give up also the notion of any 'natural' wages settled by a standard of living, what have we left?"

Without considering the effect of these suggestions on the entire theory of distribution, let us note what is implied in regard to the *supply* of capital and labor. The importance of this factor cannot be denied. All that seems to be in doubt is the possibility of a definite, yet simple, general theory of the factors which determine it. Is not a "first approximation" impracticable where so many unmeasurable forces are at work? Certainly the clearness of graphic or of mathematical exposition is not to be attained. And yet we need not become agnostic to the extent of proclaiming a final "ignorabimus." All that is necessary is to recognize that extended and patient description and analysis may make plain what cannot be expressed in the neat, crisp formulae of a general theory.

Such probably is the feeling of a large number of economists. In regard to the supply price of capital the classical school were by no means confident, and protest against the

<sup>1</sup> In the issue of this Journal for August, 1917.

notion of supply as uniformly regulated by the rate of interest was not lacking among earlier writers.<sup>1</sup> A really clear-cut theory of the supply price of capital is a recent development and is far from being generally accepted. It seems, indeed, rather too obvious that the larger part of our present supply of capital is piled up without reference to a definite rate of return. The conscious decision to save or not to save, what Arturo Labriola jocularly refers to as the birth control of capital,<sup>2</sup> is of trifling significance. In regard to the factors governing the supply of labor, on the other hand, there seems to be less readiness to formulate definite propositions among modern writers than among the classical school. In fact, the whole theory of wages is often left in vague, diffuse terms while writers of a realistic cast of mind have gone so far as to deny the validity of any general theory.

Now contrary to the prevailing tendency, I venture to argue that the formulation of a fairly brief and definite theory of the supply price of labor is a possibility, and is much easier and more defensible than any corresponding formulation for capital. It must, however, be set against a different background from that generally given. Classical doctrine assumed a closed economic area, an isolated state or nation — legitimately enough at a time when immigration of labor and capital were inconsiderable. Modern theory also presupposes a closed area or market. Perhaps unconsciously, it is often taken to lie within national boundaries. Note for instance, the term "national dividend." A wider range would obviously be more appropriate. But any definite general formulation of the factors determining the supply price of labor, such for instance as the subsistence theory of wages with its Malthusian presuppositions, becomes impossible when it is based on the idea of a closed area, whether national or international.

Let us examine two of the conceptions underlying Ricardo's subsistence theory. They are first, a great stability of the standard of living of the working class; and second, a wage at which population would remain stationary — the "nat-

<sup>1</sup> For instance, Richard Jones.

<sup>2</sup> *Riforme e Rivoluzione Sociale*.

ural price of labor." Granting for the moment the truth of the first, reflection on the second suggests that there is only one rate of wages which will bring forth a definite supply of labor, and which can therefore be a point of equilibrium between the forces of demand and supply. Any wage above this "natural" rate, as long as it was maintained, would cause a continued increase of the working population; any wage below it, if maintained long enough, would result in a decrease of population even to the extinction of the race. The labor supply called forth by any but the unique "natural" rate of wages would vary, therefore, according to the length of time the rate in question is kept up. It would set no final goal to supply. Nor could any supply curve that has yet been devised picture such unstatic conditions. If the supply of labor is to be thought of as a matter of population, there can be no definite scale of supply prices. When, however, the idea of such a scale is applied to different degrees of exertion or efficiency on the part of an existing population, as is done by Marshall, it is less open to objection, altho it is obvious that the elasticity of such supply is within narrow limits.

It was the impossibility of maintaining the conception of a fixed standard of living, which proved the stumbling block of Ricardo's theory; that, and the slowness of any considerable change in the total supply of labor through changes in marriage, birth, and death rates. Not that the idea of a standard of living was given up altogether, or its influence on the birth rate denied. Unstable as any such standard may be, it exerts an influence on the birth rate, while it lasts, and, therefore, ultimately, on the supply of laborers. What must be rejected is the notion that any of these temporary standards, with their long delayed effects on the size of population, can become a point of equilibrium for demand and supply. If the conception of a cost of production for labor power is at all permissible, we may argue that wages always and necessarily include a quasi-rent, positive or negative.

The whole problem appears in a different light if we give up the assumption of a closed area for the play of the forces of demand and supply. Just as it is permissible for economic

theory to accept without explanation the operation of factors that have come down from precapitalistic times, so we may accept conditions obtaining in regions outside of the capitalistic, when those regions are important sources of labor supply for capitalistic industry. In the backward agricultural regions of Europe from which the larger part of the unskilled labor in American industries is derived, there is a great fixity of standards of living. To that extent the Ricardian reasoning may apply to these regions. In my book on Profit and Wages, I ventured the statement that "if we had only these old world conditions to consider, the classical doctrine of wages adjusted to cost of subsistence might be allowed as a rough approximation of the actual forces at work." It must be confessed it is a very rough one indeed. But for a theory of wages applicable to modern industry, it is not necessary to give a complete account of the factors determining wages in those old world, noncapitalistic areas from which so much of our labor supply has come. The theory of wages propounded in my book merely affirms that the scale of wages found in these noncapitalistic regions, no matter what it be or how explained, is part of the supply price of labor to be paid by capitalistic industry. Add to that wage "a differential or premium resulting from the expenses of immigration and perhaps the deterrent effect of distance and unfamiliarity" (to borrow Professor Taussig's phraseology) and we have the complete supply price for unskilled labor. The larger the supply desired, the greater must be the premium. The familiar curve representing supply subject to increasing cost is applicable. Moreover, an increase of supply through immigration can come about as quickly as an increase of demand due to growth of capital. An equilibrium between demand and supply may be reached, and static theory comes to its own. For higher grades of labor the starting point of the supply price is the wages paid to the unskilled. To this must be added a premium to induce development out of the lower grade into the higher. But there the explanation becomes somewhat tenuous, and theory may do less violence to the facts if it assume the supply of the higher grades as fixed.

To countries with a small influx of immigrants, such as Great Britain and Germany, this theory may appear altogether inapplicable. The question, however, is whether they have within their own boundaries precapitalistic areas of low and stable standards of living and of wages determined independently of capitalistic industry. To some extent this is still true, tho it must be admitted that such regions are rapidly losing their old time character. The precapitalistic areas of Great Britain and Germany, and indeed those of Europe generally, are becoming merged into the modern industrial system. Perhaps soon they will be too inconsiderable to be regarded as sources of a marginal supply of labor. Then my theory of the supply price of labor will be without support in fact. I concede prophetic truth to Professor Taussig's judgment that the outcome of my reasoning about the supply of labor and of capital is that of an "impassive unregulated impact" between them, with no "normal" return for either wages or the profit of capital.

G. A. KLEENE.

TRINITY COLLEGE,  
HARTFORD, CONN.

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### INTERNATIONAL FREIGHTS AND PRICES

IN this Journal for May, 1917 there is an article by Professor Taussig on international trade under depreciated paper, which has interested me very much, not only because of the theoretical importance of the problem treated, but with a view also to its obvious bearings on the practical questions of the present time

Still I venture to think that the concrete example chosen by Professor Taussig — *America versus England* — is too complex to be handled as it were in one single grasp. I propose therefore to approach the solution of the problem by some preparatory steps of a somewhat simpler character. It will be seen that on several points my conclusions are in agree-

ment with those drawn by Professor Taussig, altho based on a slightly modified range of argument; on some points, however, the agreement will be less complete.

I propose to assume at first two countries, both of them having free trade, and divided only by a land boundary. If these countries were both living under a specie régime there could not possibly exist different prices of the same commodity on both sides of the frontier; and if we suppose, which of course is not exactly true, that the level of prices in the interior of each country is materially the same as in the boundary districts, there could be no difference of prices at all between them.

Now the influence of borrowing, which is the main subject discussed by Professor Taussig, would show itself, for the time being, in an increasing power of purchase in the borrowing, a diminishing power of purchase in the lending country, and the result would be a greater amount of merchandise passing from the latter country to the former, a smaller amount from the former to the latter; in other words, increasing imports and diminishing exports on the side of the borrowing country. The stimulus to these altered conditions of trade is not to be found in a difference of prices in the two countries, which would be theoretically impossible and practically confined between very narrow limits; the increased demand for commodities in one country, the diminished demand in the other, would in the main be sufficient to call forth the changes alluded to.

At the same time, however, the larger circulation of merchandise in the borrowing country would require — other things being equal — a somewhat greater amount of money to put it in motion; very likely, therefore, a certain quantity of gold would pass automatically from the lending to the borrowing country. If we suppose the borrowing operations to be continued for some years on about the same scale, this transmission of gold would appear at the very beginning of the period and then stop; its effect would not be a rise of prices in the borrowing country, but only their continuance at their ordinary level; and at the same time a somewhat

smaller amount of gold in the lending country would be all that was required there in order to buy and sell the lessened amount of merchandise at the ordinary prices. I cannot see that it would make any difference in this respect, if the increased power of purchase in the borrowing country is directed towards home products rather than imported commodities; this of course would diminish the imports, but if the value of imports surpasses the value of exports by precisely the amount borrowed during the same time, there would be no occasion for sending or receiving gold.

If, on the other hand, the borrowing country had a depreciated paper currency, the result no doubt would be different. As there is no opportunity for sending gold from the lending country, prices there will rise, and in the borrowing country, if with Professor Taussig we suppose the quantity of paper unaltered, prices, *reckoned in paper*, will fall. The seeming paradox of merchandise going in increased quantities from a country where prices are rising, to a country where they are falling, will disappear at once if we consider that the prices *reckoned in gold* will necessarily rise in the borrowing country too — practically indeed somewhat more than in the lending country — so that the specie premium will go down from both these causes.

This is a point of a very great interest. In both countries put together there is still, physically, the same amount of money, gold and paper. But *virtually* the quantity of gold has risen because the paper now represents more gold; therefore the gold prices will rise and the value of gold will be diminished — in both countries. We see then that the value of gold may possibly go down without any influx of the metal to the gold countries and even without any increase of paper money in other countries — supposing, of course, its being depreciated before — solely as the effect of large borrowing going on from the side of the paper countries.

Now in a case such as that of America and England — disregarding for simplicity's sake, as does Professor Taussig himself, customs duties and the like — only one new factor enters, namely the cost of carrying, a point curiously enough



not at all touched by Professor Taussig. If the costs of carrying are unaltered by the borrowing operations, I cannot see why this case should not be as simple as the one treated above. But they will not be unaltered, and in this circumstance, or I am much mistaken, the real source of explanation of the phenomena, actually observed or to be expected, must be sought.

First of all, in two countries separated by the ocean there will hardly be the same price for any commodity. The goods imported to America from England must needs be so much higher in price in the former country as is sufficient to cover the charges for freight and insurance. Similarly the goods exported from America will be cheaper in America than in England by the amount of their freight and insurance charges. If we grant, as for the sake of argument we may do, that these charges to begin with are of equal amount, then the average level of prices in both countries will be about the same at first, but not after the borrowing has set in (from the side of America) because of the altered proportions of imports and exports which will follow.

The increased number of ships going from England to America with full load, and bound to go back in ballast or with insufficient cargo, must needs increase the transport charges on goods going one way and diminish the cost of sending goods the other way. What part of this burden will fall on either country seems to be a rather secondary question; the simplest supposition, which we shall here make, is that it will be divided equally between both countries. At any rate the difference of prices in the two countries shown by the goods carried from England to America will be greater than before, whereas the goods going the opposite way will show a smaller difference of prices than before. Both the imported and the exported commodities, therefore, will have a tendency to rise in America and to fall in England; which will be greater, the rise or the fall, is not easy to discern. Consequently the general level of prices will have been raised in America and lowered in England; and therefore, if both countries were living on a specie régime, a certain amount of

gold — greater than in the former case — would flow from England to America at the beginning of the borrowing period. But this influx would be the effect, not the cause of the rise of American prices, and if convertible bank notes in greater amount than before were issued in America, that influx might be superseded altogether, the range of prices still going upwards in the same way.

If, on the contrary, America had inconvertible paper money, the result would differ just as in the two cases treated above. Prices in England would slightly rise. American prices, *calculated in gold*, would rise even more than under a specie régime. Calculated in paper, however, they would slightly fall, so that perhaps the specie premium might for the time being totally disappear, if only to show itself again when the borrowing ceases. But in other respects things would go on, it seems to me, pretty much in the same way as under a specie régime. For the further differences between the two cases, pointed to by Professor Taussig, I hardly think sufficient reasons are shown; they may present themselves, of course, under special conditions, but not as the general rule.

Before laying down my pen I would draw the attention to a most important consequence of the reflections above, supposing them to be true, in respect of the present monetary relations between America and England, which of course have just the opposite turn. According to index numbers the level of prices in England has risen during the war incomparably more than in America, but still the rate of exchange between them has not diverged much from par. Some economists, for instance in Sweden, have seen in these conditions an abnormal, "artificial" state of things, only to be explained by the heavy borrowing constantly going on between the two countries, by which, it is said, the parity of exchange is maintained in spite of the difference of prices. The true explanation, however, will be seen to go just the opposite way. The difference of prices itself, not the parity of exchange, is the effect of the borrowing and this precisely because of its influence upon the height of freights. Freights of course have risen enormously both ways, but altho I have only a few

figures at hand, it seems to me unthinkable that they should have risen by nearly so much in the trade between England and America as in that between America and England.<sup>1</sup> This then accounts for the different levels of prices or rather for the difference between the two levels. The parity of exchange, on the other hand, requires no explanation so long as England maintains tolerably well the convertibility of its notes into gold. In two countries separated only by a land boundary, this could not occur, as we have shown; there a difference of prices *always* would mean a depreciation of one of the monetary standards and a corresponding deviation of the rates of exchange from par.

However, in the actual case still another circumstance is operating. Theoretically, i. e., other things being equal, the average level of prices in America would have gone down — just as the prices of England in the third of our cases above. The prices of imported commodities, it is true, in the present case would not have gone down, in view of the general enhancement of freights during the war, but the export prices in America would have forcibly fallen, because of the great enhancement of export freights. This, however, has not taken place, and the explanation lies at hand; it depends on the general depreciation of gold all over the world, caused, no doubt, in the main by the unexampled paper issues of almost all countries, or, I should rather say, by the most irrational discount policy of the leading banks, the rates of which, in my opinion, ought to have been much higher during the whole war. Consequently the average depreciation of gold is not to be estimated by the actual rise of prices in America. That

<sup>1</sup> According to the Swedish "Commercial Informations" freight rates from La Plata to Great Britain have risen during the war nearly three times as much as those from Great Britain to La Plata. Similarly freight rates from Egypt to Great Britain have risen more than twice as much as those from Great Britain to Egypt. For other countries figures are only given for freights to England, but very probably the same state of things has appeared for them. There are occasional exceptions: thus, coal freights from Great Britain have risen slightly more than the wood freights to Great Britain from Sweden.—

The general situation is the same for freight rates between the United States and England as that which Professor Wicksell here notes for rates between Sweden and England. East bound rates across the Atlantic (to England) have risen much more than west bound rates (from England). — F. W. T.

would give too small a measure; to it must be added the hypothetical fall of average prices in America, which would have come to pass, if there had been no general cause for the depreciation of gold.

I should be very glad if these lines, of whose extremely abstract character I am well aware, could be regarded as a suitable complement to the interesting remarks on the subject made by Professor Taussig.

KNUT WICKSELL.

MÖRBY, STOCKSUND, SWEDEN.

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PROFESSOR WICKSELL'S mode of dealing with the subject is in many respects different from that to which I have been accustomed. It is, therefore, not always easy for me to follow his reasoning. I will touch only on some salient points.

The whole problem of the relation between prices and the movement of money (gold) is handled by Professor Wicksell in terms which lead me to pause. He agrees that where international borrowing takes place, a larger volume of commodities will be bought and sold in the borrowing country than before. But in his opinion, the stimulus which brings about this quantitative increase is not to be found in a difference of prices between the two countries. He believes (page 405) that "the increased demand for commodities in one country, the diminished demand in the other, will in the main be sufficient to call forth the changes alluded to." And he remarks that "the larger circulation of merchandise in the borrowing country would *require*, other things being equal, a somewhat greater amount of money to put them in motion; very likely, therefore, a certain quantity of gold would pass *automatically* from the lending to the borrowing country."<sup>1</sup> This seems to me questionable. I find it difficult to conceive how "increased demand for commodities" will cause a rise in the price of commodities, unless more money is offered for

<sup>1</sup> Italics are mine.

them; and no more money can be offered for them unless the supply of money is larger. (It is not necessary to state the modifications which must be attached to any such bald statement of the "quantity theory"; the conversant reader will bear them in mind.) Professor Wicksell's statement that a larger circulation of goods requires a greater amount of money "to put them in motion," seems to me metaphorical and inconclusive. If there be more goods and no more gold, and if this is the sole change that takes place, prices will fall. That fall in prices may lead in turn to a redistribution of gold and to an eventual increase in the monetary supply in the country where prices at first were lower. But the process is one that requires time; there is a period of transition before the eventual result is reached. The gold moves, not "automatically," but as a *result* of changed prices, or (for short periods) of changed rates of discount.

A similar difference in point of view appears in another passage in Professor Wicksell's note (page 408) where, discussing variations in price movements as between the United States and England, he remarks that the "difference of prices itself is the effect of borrowing." It does not seem to me to be in itself a consequence of borrowing, or of an automatic adjustment of monetary supply to quantity of commodities bought and sold. The change in prices, to repeat, seems to me an ulterior consequence, not a direct or automatic one.

I find a further difficulty. Professor Wicksell seems throughout to treat the movements of prices for domestic commodities and for international commodities as if they were always parallel, and as if the influences acting on the one set always acted in the same way on the other.<sup>1</sup>

At the very outset, he passes from a statement about the prices of competitive or international commodities to another statement, by no means a corollary, about the general level of prices. It is true that, if we ignore cost of transportation, the same commodity must be at the same

<sup>1</sup> On the importance of this distinction I have said something in an article on "Wages and Prices in International Trade," in this Journal, August, 1906.

price in contiguous countries; but it by no means follows that the general level of prices must be the same in both, still less the general level of money incomes. And this distinction is important as regards the influence of freight rates, to which he attaches such importance. He argues, for example, that a readjustment of freight rates, consequent on international borrowing, would have different effects in the borrowing country from those in the lending country. He reasons that transportation rates would be higher than before on commodities going to the borrowing country, because of the greater freight space required; whereas ships going the other way would be half empty or in ballast, and consequently would accept lower freight rates. I will not stop to discuss how far such changes in ocean freight rates are likely to take place under ordinary conditions of foreign trade. In times of peace, with an abundance of tramp steamers and triangular or roundabout voyages, effects of this kind would probably be inconsiderable. Under the present abnormal shipping conditions, Professor Wicksell's hypothesis is in accord with the facts: while all ocean freights have risen greatly, inbound rates to Western Europe have risen very much *more* than outbound rates. But admitting this to be now the case, and even supposing a similar situation to arise when international loans are made in times of peace, this particular shift does not seem to me to have the sort of significance for the theory of international trade which Professor Wicksell attributes to it. Changes in transportation charges would affect directly not the general level of prices, but the prices of international commodities only. Imported commodities would indeed be higher in the borrowing country if sent thither from the lending country. But it does not at all follow that this factor in itself would cause a general rise of prices in the borrowing country. It is entirely possible that the prices of iron, for instance, should rise in the United States when imported from England, say as a sequel to American loans there, because cost of transportation from England to the United States may have risen. But at the same time domestic prices and money incomes in the United States may have remained stationary.

If they have risen, it will be because of increased monetary supply; and the rise will be due to a different cause from the increase of freight rates, and may be greater or less in extent.

The same problem suggests itself in connection with Professor Wicksell's discussion of countries separated by a land frontier and those separated by the ocean. In the former case he thinks cost of transportation is negligible; for the latter he treats it as a matter of some consequence. Here again it may be a question whether the particular distinction is in fact of importance. Transportation by water is so much cheaper than by land that the effective range of possible price variation for a given article may be less between England and the eastern seaboard of the United States than between Germany and Austria. But this query does not touch the point which I find troublesome in Professor Wicksell's general reasoning. He seems to assume that between two countries separated by land frontier (in which case, on his assumption, we may neglect expenses of transportation), prices will be identically the same throughout the two for all commodities. By no means. Between such countries the prices of international commodities will doubtless be the same; but the prices of domestic commodities and, above all, the rates of money incomes may be substantially different. It is precisely these differences in domestic prices and in money incomes which constitute the special and peculiar problems of the theory of international trade.

Hence, to conclude, the effects of changes in freight rates, which Professor Wicksell regards as a neglected unimportant factor in the theory of international trade and international borrowing, do not in my judgment lead to new generalizations. Their effects are similar to those of changes in cost of production or cost of transportation within a country. These may cause lower prices of particular commodities within the country, or in foreign countries; but the consequences for the different price levels in different countries depend on quite other factors than those adduced by Professor Wicksell, and more particularly on the elasticity of demand for the commodities in question.



I would not close this note without expressing my appreciation of the high interest of Professor Wicksell's comments, and of the value of discussion from a novel point of view; nor without expressing my satisfaction that he proceeds on the principle that, however the course of international trade be disturbed by the shock of war, the international exchange of scientific opinion should be maintained without interruption.

F. W. TAUSSIG.

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